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Original Articles

THE LIMITATIONS OF ORTHODONTIC TREATMENT

II. DIAGNOSIS AND TREATMENT IN THE PERMANENT DENTITION

HAYS N. NANCE, D.D.S.,* PASADENA, CALIF.

INTRODUCTION

IN A previous paper,[1] the author pointed out that a newer, more realistic attitude toward orthodontic attainments had arisen in the past fifteen years. Supporting evidence was cited in the scientific work of Hunter, Broadbent, and Brodie, and in clinical observations of Tweed and others. The greater part of the paper was devoted to a report of the author's own clinical observations over a period of twenty-six years, based on the study of patients, their dentures, x-rays and photographs, and measurements taken from their x-rays and plaster models. The paper dealt only with the mixed dentition period, and mainly with specific measurements of the denture made at different stages in its development, and of case reports of active treatment, "preventive arch" therapy, and observations without treatment.

The measurements were made upon plaster models of the deciduous, mixed, and permanent dentition periods and on x-rays of unerupted teeth. Mesiodistal widths taken from x-rays of teeth were subsequently checked by direct measurements on plaster models when the teeth had later erupted. The distance from the mesial of one mandibular first permanent molar around the arch to the

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* Lecturer, Division of Orthodontics, College of Dentistry, University of California.

corresponding point on the opposite side was determined, and changes which occurred in this dimension with further development of the dentition were considered.* The anteroposterior relationships of the mandibular first permanent molars and of the incisors were also considered with respect to the results of growth and the substitution of permanent for deciduous teeth. What follows orthodontic treatment after the denture is released from retentive devices was critically examined. Changes in the width of the denture as measured across the arch (during treatment and after) were also studied. Precisely how these measurements were obtained and how the dimensions altered with growth, treatment, and during post-treatment observation will be described later in this paper. While the mixed dentition presents almost as great variety of complexities as does the permanent dentition, the typical mixed dentition case may be described as follows:

A normal mesiodistal relationship of the deciduous canines and deciduous molars, with the incisors and first molars the only permanent teeth in either arch; crowding in the mandibular anterior segment, with the buccolingual relationship of the mandibular and maxillary teeth normal; and end-on relationship mesiodistally of the first permanent molars instead of the cusp-in-groove relationship which characterizes the normal permanent dentition.

The orthodontist usually sees the typical mixed dentition case when the parent becomes alarmed over the irregularity in the mandibular incisors. This condition is more often than not treated by the orthodontist, who is frequently perplexed by the end-on relationship of first permanent molars.

One may see the really simple reason for this relationship if he considers some average tooth measurements: the sum of the average widths of the maxillary deciduous canine, first molar, and second molar of one side equals 0.9 mm. more than the total of the mesiodistal widths of the three permanent teeth which succeed them. In the previous paper this difference was called "leeway." The same sort of comparison in the mandibular arch, again using average mesiodistal widths, shows that the average leeway is 1.7 mm., nearly 1 mm. more than in the maxillary arch.

These comparisons show that the three deciduous teeth of each arch occupy slightly more space than the teeth that succeed them, which, therefore, means that the first permanent molars must erupt in positions distal to the ones which they will occupy when the deciduous teeth are shed and replaced by the smaller permanent successors. By the same token, they must position themselves forward during the transition from the mixed to the permanent dentition. Since the leeway is greater in the average mandibular arch than in the maxillary arch, the forward positioning of mandibular first molars exceeds in amount that of the maxillary molars, and accounts for the change from end-on to cusp-in-groove relationships.

A failure to appreciate this disparity in tooth widths leads some orthodontists to classify incorrectly this end-on relationship as "Class II tendency."

*This distance, of course, must be equal in length to the sum of the mesiodistal widths of all the premolars, canines, and incisors of the mandibular arch, if those teeth are to be aligned in nonrotated positions.

Consequently, they either treat such a case until there is a cusp-in-groove relationship of first permanent molars, with an edge-to-edge relationship of the maxillary and mandibular incisors, or they leave the first permanent molars in end-on relationship in order to obtain a more nearly normal relationship of anterior teeth.

It was shown in the previous paper on the mixed dentition that treatment during this period is usually futile, and that, in most cases, the proper time to institute active treatment is in the early permanent dentition period, but not until the canines and premolars have erupted sufficiently to be banded. The paper described how, in the minority of cases wherein mixed dentition treatment is indicated, such treatment is facilitated by premature removal of mandibular deciduous canines, thus eliminating unnecessary overexpansion and at the same time permitting a satisfactory relationship not only of the first molars, but of the incisors as well.

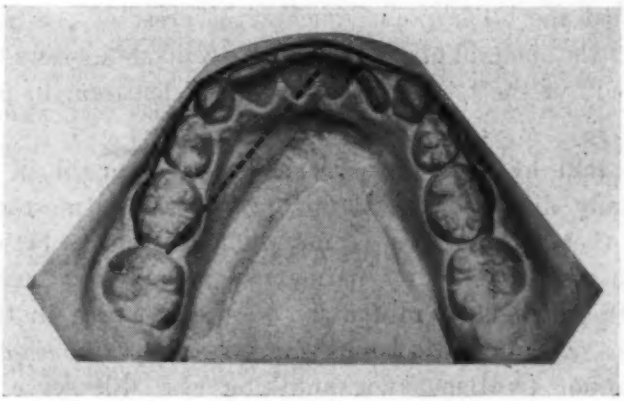

Fig. 1.—Illustrating two measurements important in case analysis of the mandibular dental arch. While the figure shows a model of the mixed dentition, the distance between first permanent molars may be measured in the same fashion in the permanent dentition. The solid line is the "outside" measurement, determined on the model with ordinary brass wire; the dotted line is the "inside" measurement, determined with dividers. (See text.)

The difference in size between the deciduous and permanent teeth, called leeway, is partially or wholly taken up by the natural forward positioning of the mandibular first permanent molars. This must always be taken into account in determining the prognosis of any mixed dentition case. Details of the method for determining the leeway were described in the previous paper, together with the manner in which these measurements were used in arriving at a decision as to whether treatment of any sort is indicated, and the nature of that treatment when it seems advisable.

Another useful measurement is the "outside" measurement. To obtain this, carefully adapt ordinary brass ligature wire to the buccal surfaces of the mandibular teeth in their middle third, so that one end of the wire enters the interproximal space between the mandibular second deciduous molar and the first permanent molar, touching the mesial surface of the latter tooth. Then carry the wire around the buccal and labial surfaces of the teeth as indicated

in Fig. 1 and adapt it so that it enters the corresponding embrasure of the opposite side in the same fashion. This measures the amount of room available for permanent teeth between the mesial surfaces of the mandibular first permanent molars.

In every one of the mixed dentition cases that was measured in this manner, it was found, with later measurements, that this outside measurement had shortened by the time the premolars and permanent canines were fully erupted.* Because this always occurred, it was concluded that the first permanent molars had unquestionably positioned themselves forward in the transition from deciduous to permanent dentition.

The anteroposterior relationship of the mandibular first permanent molars and incisors in the mixed dentition and permanent dentition stages of development was studied by taking a measurement called the "inside" measurement, using an ordinary pair of dividers. To determine this, place one point of the dividers at the mesiolingual of the first permanent molar of one side and open the dividers until the other point touches the crest of the gingival tissue at the lingual of the mandibular permanent central incisors. This distance always shortened* in the transition from mixed dentition to permanent dentition.

The story told by these measurements, as observed in case after case drawn from many different orthodontic practices, was most consistent. This convinced me that when there is not sufficient space between the mesial surfaces of the mandibular first permanent molars to accommodate the ten permanent teeth which must ultimately occupy the area in the arch between these teeth, *plus an additional amount for forward positioning of these molars,* neither growth nor treatment nor anything else will serve permanently to accommodate those teeth in nonrotated positions.

This limits drastically the possibilities of accomplishment of the orthodontist in the mixed dentition period: he may treat patients with crossbites (anterior or posterior), Class II, Division 1 malocclusions in which the facial profile is markedly affected† and Class III malocclusions. In certain other cases, he may order the premature removal of the mandibular deciduous canines and do nothing more; in a limited number of cases, he may place a preventive lingual arch for a brief period prior to the shedding of the mandibular second deciduous molars, removing it after eruption of the permanent teeth. To undertake any more than this is to set out upon a program which will lead only to waste of time, money, and effort. A few exceptions to these generalizations have been covered in the previous paper and, since the exceptions in the permanent dentition are materially the same, they will be reviewed in connection with the treatment of the older child.

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*With the exception of one mixed dentition Class II, Division 2. This point is explained later.

†These patients should be treated in the mixed dentition even if the analysis of the case indicates that a second period of treatment involving extraction in the permanent dentition will be necessary.

ARCH LENGTH—THE PROBLEM OF MAKING ROOM FOR TEETH

Arch length may be defined as the distance from the distal surface of the most distally erupted tooth of a given arch to the distal surface of the most distally placed tooth of the opposite side, measured around the arch. Most cases which present rotations or collapse in the mandibular anterior segment, or teeth situated labially, or lingually, to the normal line of occlusion, are problems in arch length.

Systematic study of cases, treated with a variety of appliances and according to various philosophies of treatment, reveals the fact that satisfactory methods of solving the problem of accommodating teeth in nonrotated positions over basal bone are extremely few. This does not mean that it is particularly difficult, by means of orthodontic appliances, to line up the teeth of an arch to normal contact point relationships. As a matter of fact, this is downright easy provided one ignores the relationships of those teeth to supporting bone.

The search for an adequate rationale becomes difficult only when one insists that the results of orthodontic treatment be permanent. Since every orthodontist presumably seeks procedures that will not be followed by relapse within a few years after the removal of retaining devices, we shall list the methods that may be used to align teeth in nonrotated positions, and analyze them one by one to determine whether they will or will not lead to a stable, permanent result:

1. *Distal movement of mandibular posterior teeth.*
2. *Uprighting of mandibular posterior teeth which have actually tipped forward.*
3. *Labial movement of mandibular incisors.*
4. *Buccal expansion.*
5. *Rotation of mandibular molars and premolars.*

It is with this limited number of resources, each far from infallible, that we seek to obtain space for malposed teeth. Lest some reader feel that the sacrosanct subject of growth, not always understood but invariably given elaborate mention in orthodontic writing, is slighted by being left out of this list, it should be pointed out that growth, per se, has no place in it. While growth can and does enlarge the area in which teeth may be placed, it performs this function in limited regions and not just wherever we might wish it. Accordingly, we are obliged to have at our command effective procedures of treatment if we are to place the teeth in desirable positions; it is these procedures with which the preceding list deals.

Let us consider these points in more detail:

1. *Distal movement of mandibular posterior teeth:*

It is possible, but indeed difficult, to move molars and premolars distally in the mandibular arch. Such efforts are usually attended by a burying of the distal surface of the last tooth in soft tissues, with consequent irritation and even suppuration. Such measures might be defensible were it not for the

abundant clinical proof to prove that these teeth moved distally will not stay distally, but will come forward again, as if seeking to remain in the positions from which they were disturbed. This statement will be verified by actual clinical cases.

2. *Uprighting and distal movement of mandibular posterior teeth which have actually tipped forward from their normal environmental positions:*

It is extremely important, at this point, to differentiate between *actual forward tipping* of teeth and the phenomenon which is so commonly and erroneously called "mesial drift." Mesial crown tipping occurs when mandibular second deciduous molars are prematurely extracted or are removed in the congenital absence of the mandibular second premolars, and when mandibular second premolars are lost through dental decay. In cases which have sustained such losses, the axial inclination of the first permanent molar testifies to the fact that the crown has come forward more rapidly than the root, the broad surfaces of which effectively resist movement through the alveolar bone. No such perverted mesial inclination may be observed in mandibular molars in cases where there is gross loss of arch length without loss of tooth structure. The word "drift" implies a gradual bodily movement from a previous position to a new one. In the vast majority of cases characterized by crowding, these molars have not drifted abnormally forward, to account for the loss of arch length; *they never were back far enough to accommodate all teeth present in the arch in the first place,* presumably because of insufficient growth of mandibular basal bone.* In the instances enumerated previously as true mesial tipping or drift, it is possible to restore the molars to the positions from whence they came. If this amount of distal crown movement is sufficient to accommodate all the teeth present in the arch, prognosis for permanence of result is good.

3. *Labial movement of mandibular incisors:*

This method of gaining room for teeth in the arch is suicidal, except in a limited number of cases which may be specifically defined. These exceptions consist of Class II, Division 2 malocclusions and Class I cases which resemble them, where the mandibular incisors have an abnormal lingual-axial inclination, maintained by a deep overbite or some other mechanical means, that is, lip pressure or finger pressure. One can and should upright these teeth to their normal positions over basal bone. To resort to such easy but disastrous methods in any other type of case is to invite collapse of the mandibular anterior segment; or to give the patient an unpleasant and unnatural appearance should the anterior segment fail to collapse. If such treatment is carried to extremes, it can also cause irreparable damage to the labial alveolar plate of bone and the investing soft tissues.

4. *Buccal expansion of mandibular molars and premolars:*

Of all the possible methods of gaining arch length which are listed here,

*Strictly speaking, in the mixed dentition there might actually have been sufficient space for the ten permanent teeth which eventually erupted into the arch. All of this space is not available, however, because of the inevitable forward positioning of the first permanent molars as previously described.

buccal expansion is the most rewarding, but still pitifully inadequate in the majority of cases. Just as there are occasional cases which require slight labial movement of anterior mandibular teeth (cited previously), there are other cases in which there is contraction of the dental arches in the molar and premolar regions which can be corrected by careful widening. This procedure, too, can be overdone with the same consequences that follow excessive labial movement of anterior mandibular teeth: eventual relapse, and possible tissue damage. Unlike the type of treatment in which mandibular incisors are carried too far forward, overexpansion of the arch in the molar and premolar areas does not greately affect the appearance of the face in repose. When the patient smiles, however, the "orthodontic mouth" is revealed in all its doubtful "glory": flattened anterior segments, prominent canines, and a buccal width which is far from pleasing. Precisely how much of this width may be maintained will be shown later with treated cases.

5. *Rotation of mandibular molars and premolars:*

It is obvious that unless the anatomic contact points of the molars and premolars are in normal relationships, more arch length is required for these teeth than would be necessary if they were properly rotated into place. While the accomplishment of these necessary rotations seldom gives enough additional room to simplify treatment, failure to rotate these teeth often disturbs the balance of an otherwise well-treated case. This is particularly true with respect to maxillary first permanent molars, which some men leave at the end of treatment, with the mesial portion placed too far lingually, that is, with the mesiobuccal cusp lingually placed and the distolingual cusp buccally placed. This molar, because of its rhomboidal shape, then claims too much room in the maxillary arch, often as much as 1.5 to 2 mm. more than its actual width. This requires either excessive distal positioning of this tooth or forces the maxillary canine to occupy a position mesial to its normal one, where it strikes the mandibular canine on excursions of the jaw instead of gliding through the embrasure.

The statements made previously portray the orthodontist as a person of limited powers. They declare that the procedures, which have been used for many years by orthodontists in order to gain space for rotated and otherwise malposed teeth, have no lasting effect. A few exceptions, which are mentioned in the interest of accuracy, provide but little in the way of arch length, and are encountered in only the minority of cases. What provides the basis for such positive statements?

These statements are made after a long-term study of information revealed by what are called above "outside" and "inside" measurements, which are shown graphically in Fig. 1. The reader will readily grasp what each of these measurements would show after a period of orthodontic treatment when each of the procedures listed was put into effect. With an occasional exception, whenever there are rotations or other malpositions of teeth, the outside measurement must be increased. Distal movement of posterior teeth, labial movement of anterior teeth, and buccal expansion increase this measurement.

Unfortunately, as will be shown later, such increase is nearly always transitory when obtained by means of the first two procedures; and all too frequently it is transitory when obtained by the third.

The inside measurement records the anteroposterior relationships of the mandibular first molars to the mandibular incisors, and its length may be either increased or decreased, depending upon the treatment used to increase the outside dimension. For example, the distal movement of molars or the labial movement of incisors increases the inside measurement. Buccal expansion, if accompanied by lingual movement of the incisors to their proper positions over basal bone, decreases this inside measurement.* This is because more arch length is used up by any appreciable lingual uprighting of mandibular incisors than is usually gained and *maintained* through buccal expansion.

The statements made in this paper and my present rationale of orthodontic practice are based on the systematic comparison of many such measurements taken prior to treatment, at the end of active treatment, and many years after discarding all retentive devices.

The futility of the usual methods of treatment became overwhelmingly evident when it was discovered that the outside measurement could be permanently increased only under one of these conditions:

1. In cases where the mandibular incisors were tipped *lingually* (as in deep overbite cases) and required uprighting.
2. In cases which had sustained the loss of teeth.
3. By employing buccal expansion.
4. By creating a toothy appearance and an unsightly profile, by general overexpansion.

Expansion failed in the majority of cases as a satisfactory solution to the problem of arch length, since the greatest permanent increase in the outside measurement I have been able to gain by this procedure amounted to only 2.6 mm., less than half the average width of the smallest permanent tooth in the human dentition. Keep in mind that this is not an amount one may expect routinely to gain and maintain, but, according to my observations it is a maximal figure.

The inside measurement showed a permanent increase only in those infrequently encountered cases where actual mesial tipping of mandibular first permanent molars had occurred as result of premature loss or congenital absence of mandibular second premolars; or where there was lingual tipping of mandibular incisors requiring that they be uprighted. In all other types of cases, the increase in the inside measurement, obtained through the distal movement of posterior teeth or the labial movement of incisors, was either transitory or gained at the expense of facial balance. And, furthermore, if the case was observed for a reasonable time after retentive devices had been discarded, it was discovered that either the inside measurement had returned to the original value found before treatment, or that esthetics had been sacrificed.

*A differentiation between buccal expansion as commonly used and *true lateral movement* of buccal segments will be dealt with in a later paper on treatment procedures.

The distal movement of mandibular molars and premolars, which has for its object the accommodation of other permanent teeth in nonrotated positions, will not lead to a permanent result, regardless of the presence or absence of mandibular third molars. This is borne out by the fact that the outside measurement cannot be permanently increased.* It has already been shown that it is impossible even to maintain mandibular first permanent molars in the positions in which they erupt, but that they will position themselves mesially upon the shedding of the second deciduous molars. This being true, it should be entirely obvious that to move them distally and expect them to remain there is a vain hope.

WHAT IS "BASAL BONE"?

The term "basal bone" appears so frequently that it seems desirable to define it here. While the author has no wish to question the motives of those who disagree with him on certain points, it seems to him that some of the confusion and misunderstanding over the definition of basal bone is more pretended than real, and that on some occasions those who haggle over terminology have sought to becloud issues rather than to clarify them.

I define basal bone as being those portions of the maxillae and mandible that are exclusive of teeth and alveolar process. It is, if you will, what remains of these bones after the loss of all the teeth and the consequent resorption of alveolar process.

While it seems to me unbelievable that any modern orthodontist can be genuinely unaware of what is meant by basal bone, debate over what constitutes the proper relationship of the dental arch to its bony base is perhaps more admissible. While I believe that I am competent to recognize the difference between a satisfactory and an unsatisfactory relationship of dental arch to basal bone, I do not believe that it is possible to arrive at this distinction by the application of some ironclad rule or some geometric procedure which must unfailingly arrive at a correct diagnosis. I do not believe that, in a biologic field such as orthodontics, it is consistently, if ever, possible to make a correct diagnosis through such arbitrary methods. But I do believe it is entirely possible for one to develop clinical judgment which will lead to correct appraisals.

THE TERM "DOUBLE PROTRUSION"

While on the subject of terminology, we may appropriately consider another term which has been the occasion of disagreement and misunderstanding. I refer to the often-heard expression "double protrusion," more familiarly called "DP." This has been applied not only to cases where the crowns of the teeth seem to lean forward of their bony support, but also to Class I cases in which axial inclinations of the incisors were good before treatment, but where a forward leaning would be produced if rotations were corrected by expansion alone. In my opinion, both of these conditions may be attributed to insufficient growth of bony support for the dental arches. A true double protrusion or

*Allowing for the exceptions cited previously.

bimaxillary prognathism is one in which not only the dental arches, but the supporting structures as well, are situated too far forward in relation to the cranium. These cases are seen but rarely.

Some orthodontists, paying excessive respect to the term double protrusion, have been guilty of tipping the mandibular incisors too far lingually. If my interpretation of clinical results is correct, some of the disappointments in treatment which have followed extraction of the four first premolars may be attributed to attempts to close the spaces entirely by distal movement of the canines and lingual tipping of the incisors. These disappointments take the form of "dished in" faces, due to tipping maxillary and mandibular incisors too far lingually—beyond their normal axial positions; or cases wherein the spaces are not completely closed; or other cases wherein the contact points open after retention is discontinued because teeth were not kept in upright positions during the space-closing procedures. In my opinion, it is far better, when extraction has been adopted, to "unravel" the rotated anterior teeth into the spaces, or to tip the incisors lingually to, but not beyond, their normal axial positions when their crowns were originally tipped forward. Closure of any remaining spaces should be accomplished by bodily mesial movement of the posterior teeth. It is extremely difficult to move the six mandibular anterior teeth too far lingually in *bodily fashion;* therefore an appliance setup should be used that will maintain these teeth in their correct axial positions while the posterior teeth are being moved bodily forward. Undesirable consequences of treatment in which extraction has played a part occur all too frequently. I believe, however, that the blame should be laid not upon extraction itself, but upon the plan of treatment which was used following extraction.

Findings discussed herein suggest that the orthodontist intelligently face the fact that he is given a limited amount of basal bone area in which he may position teeth, and that if he wishes to obtain permanent results, he should not seek to enlarge that area, since efforts to do so will be rewarded only with failure.

The orthodontist who accepts the limitations and seeks to accomplish the maximum in benefits to his patient must seek the therapeutic procedures which will work best within each given potential. The argument as to whether or not extraction has a place in orthodontic practice should be deemed closed, and an intensive study of improved methods for dealing with the remaining teeth in extraction cases should be undertaken. It is my intention to show a series of treated cases which, I believe, will emphasize the statements made previously. Some of these illustrate errors in procedure, and others correct procedure with consequent good results.

CASES TREATED IN THE PERMANENT DENTITION

I have already indicated my belief that the route to successful orthodontic treatment involves determining the potentialities and limitations of the individual case, and doing one's best within those potentialities and limitations. I have concluded from observation and measurement that when the ortho-

dontist observes the treated patient over a number of years after the retention phase has been completed, and finds that the result is stable and without relapse, basal bone adequate to support all the teeth present was there from the start, and the orthodontist did nothing to alter the prime requisites one way or another. Orthodontic treatment, therefore, consists of repositioning teeth in proper alignment and normal occlusion insofar as there is adequate bony support to permit it. The cases which follow will illustrate some of these points.

Fig. 2 shows a Class I malocclusion which is admittedly not a severe one, but, nevertheless, illustrative of some of the principles elaborated in this paper.

This case presented for treatment with an end-on relationship of maxillary and mandibular posterior teeth, a slight overbite problem, and mandibular incisor teeth which were tipped forward. In treatment, widening of the posterior portions of the arches permitted uprighting of the mandibular incisors over basal bone; correction of the overbite and of the mesiodistal discrepancy between the two arches was accomplished as a matter of course.

Fig. 3 shows the case several years after the retentive devices had been discarded. If you were to use dividers to make measurements on the models shown in Figs. 2 and 3, you would see the extent of the change brought about through treatment and held over the years. Intercanine width in Fig. 3, representing years out of retention, is 1.5 mm. greater than the same dimension in Fig. 2. Next, consider the distance across the mandibular first premolars: this distance is 1.75 mm. greater in Fig. 3 than in Fig. 2. The same value holds for the distance across the second premolars. An increase of 2.0 mm. was gained and held across the first permanent molars. What about the outside and inside measurements? We find the outside measurement in the models made several years out of retention the same as it was in the original models. The inside measurement, on the other hand, has been reduced 1.4 mm. This shortening is due to lingual positioning of mandibular anterior teeth over basal bone, allowed by buccal expansion. The consequent facial improvement may be noted in Fig. 4. The very satisfactory occlusion apparent in Fig 3 was possible simply because this case possessed all the inherent potentialities for normal occlusion from the very beginning. Closure of spaces in the premolar areas cancelled out what would have been an increase in the outside measurement as a result of buccal expansion.

The next malocclusion (Fig. 5) represents in its treatment very nearly the maximum that can be obtained and held permanently through buccal expansion alone.

This Class I case with a slight overbite presented for treatment with the mandibular anterior teeth tipped slightly forward in relation to the bony base, and with space between the mandibular right first and second premolars. Comparing arch width in the models shown in Figs. 5 and 6, representing the beginning of treatment and the result two years out of retention, one finds that the intercanine width increased 1.7 mm., the width across the first premolars 1.6 mm., the width across the second premolars 5.0 mm., and the width across the first permanent molars 5.0 mm. These figures represent net increase

Fig. 2.

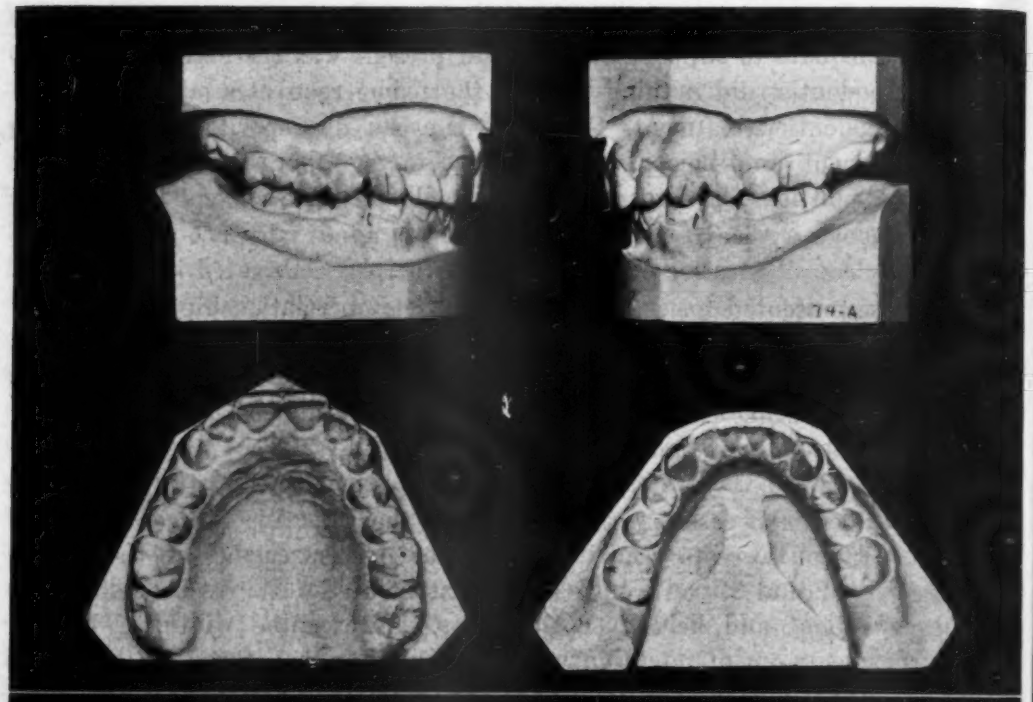


Fig. 3.

Fig. 2.—A Class I malocclusion of mild severity, in which the proper use of buccal expansion led to a stable result.

Fig. 3.—The case shown in Fig. 2, several years after retainers were discarded. Comparisons of arch width between these two sets of models are given in the text.

in width, that is, they show the increase in width measurable when the original models are compared with those made after the case was out of retention two years. It will be noted that, compared to the other values, the increase across the first premolars is misleadingly small. This may be explained by pointing out that the mandibular right first premolar was already buccal to the line of the other teeth at the beginning of treatment and relatively little expansion beyond that position was required. The outside measurement increased 1.9 mm., while the inside measurement remained the same. The failure of the inside measurement to shorten indicates only one thing: that the mandibular incisors were not moved lingually to a sufficient extent in the expansion process, as were the mandibular incisors of the case previously shown. The result shown in Fig. 6 is a satisfactory one, and it represents all one can hope to obtain through buccal expansion alone.

Fig. 4.—Showing facial improvement resulting from uprighting anterior teeth over basal bone. Profile photographs correspond to models shown in Figs. 2 and 3.

Although this next case has been previously reported in the literature,[2] it is presented again because the original publication did not submit the case to the same sort of analysis which is undertaken here, and because the case illustrates some of the principles under discussion. This Class II, Division 2 case, typical of the more extreme sort found in that category, was treated for a period of sixteen months in the mixed dentition, with a later relapse in spite of the fact that retainers were worn for a considerable length of time. This paper is limited to a consideration of the permanent dentition; therefore, I shall touch upon only a few of the salient features concerning this period of mixed dentition treatment. Study and analysis of the original models and x-rays many years later revealed that there was present a leeway of 2.4 mm. on each side, only 0.7 mm. more than average, making a total of 4.8 mm. for both sides.

Fig. 5.

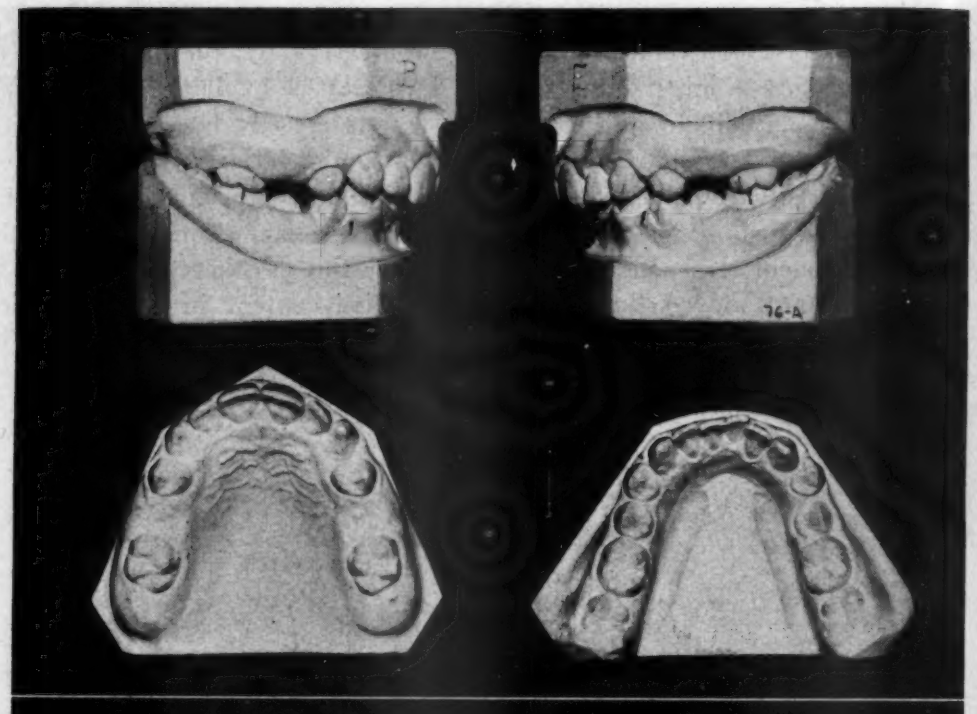


Fig. 6.

Fig. 5.—Expansion was used in this case, leading to a stable result which is very nearly the maximum that can be obtained and held through buccal expansion alone.

Fig. 6.—The case shown in Fig. 5, two years after retention was discontinued.

Fig. 7.

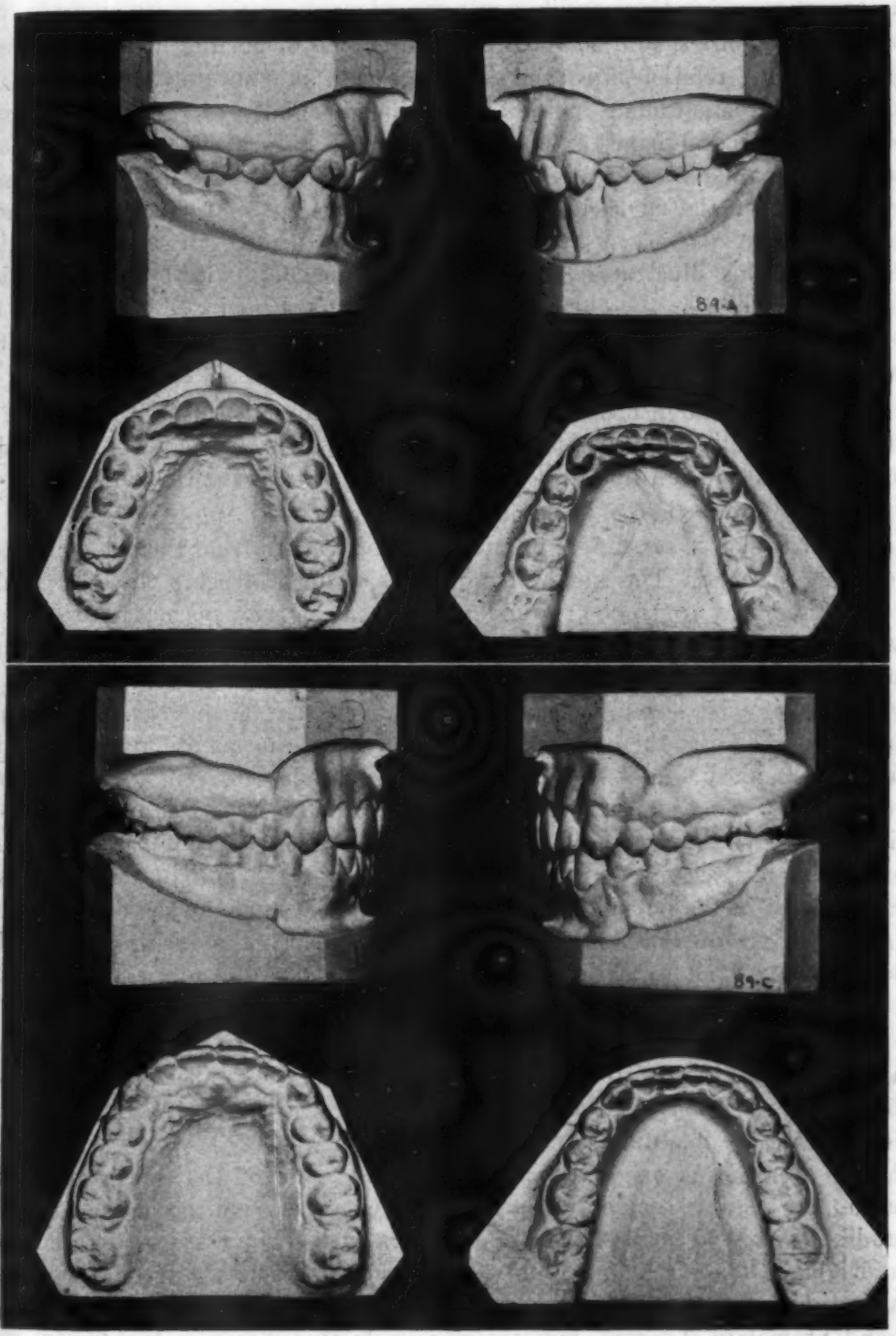


Fig. 8.

Fig. 7.—A Class II, Division 2 malocclusion in the early permanent dentition. There had been a period of mixed dentition treatment, with complete relapse as shown above.

Fig. 8.—The ultimate result, after retreatment of the case shown in Fig. 7, four years after mechanical retention was discontinued.

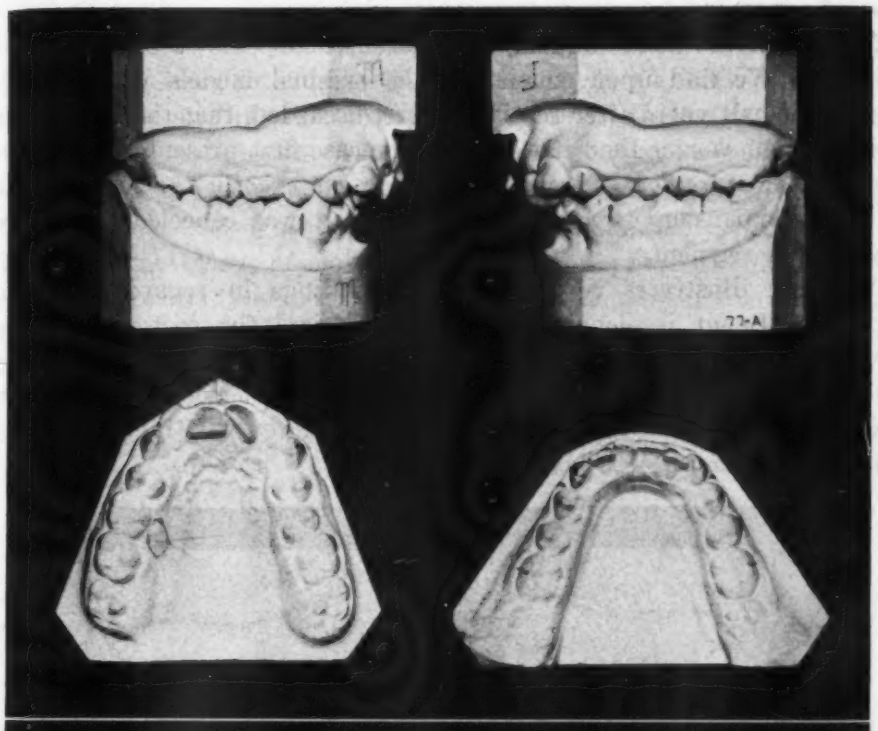
Fig. 7 shows the case as it presented for a second period of treatment. The extent to which the mandibular incisors have been tipped lingually by the severely closed bite should be noted. In the process of opening the bite, correcting mesiodistal relationships, and aligning teeth in nonrotated positions, the crowns of the mandibular incisors were tipped labially to their proper axial positions over basal bone, and the ultimate result is shown in Fig. 8, four years after all mechanical retention had been discontinued. The inside measurement on the model of the case after years out of retention is 1.4 mm. greater than it was when the case originally presented for mixed dentition treatment. This illustrates an exception mentioned previously, namely, that when the overbite or some other mechanical factor has tipped mandibular incisors lingually, they may be uprighted by moving them labially and the result may be regarded as permanent.

Lest some reader misinterpret what was accomplished in the way of a permanent result in this case through the labial movement of mandibular incisors, the next one to be presented should correct his impression.

Fig. 9 shows that this case also falls into the Angle classification of Class II, Division 2. It differs in an important feature from the one previously presented, however. The mandibular incisors, instead of being tipped lingually by the closed bite, are tipped markedly forward from their normal positions over basal bone. Fig. 10 shows the occlusion at the time the appliances were removed and retainers placed. The extent of tooth movement obtained in treatment may be seen by comparing measurements taken from the original models with those at the end of treatment. Increase in mandibular arch width across the canines was 4.0 mm., across first premolars 6.9 mm., across second premolars 5.0 mm., and across first molars 3.0 mm. Note that in spite of all this buccal expansion, mandibular incisors are still forward of basal bone support. The increase in the inside measurement at the end of treatment was 1.8 mm., and in the outside measurement it was 6.0 mm. It should be remembered that all of these measurements, particularly the inside and outside measurements, are affected by band spaces which remained at the time of retention, when this model was made.

Let us see now how the measurements taken from the original models compare with those taken from models after the case had been released from mechanical retention eight and one-half years (Fig. 11). We find that the width across the mandibular canines is, at the age of 27, exactly what it was when the case was originally begun; that is, none of the width across the mandibular canines gained through treatment was held permanently. The mandibular first premolars show a permanently held increase of 3.8 mm. over the original model, indicating that 3.1 mm. of the amount gained in treatment was lost during the retention and postretention periods. Across the mandibular second premolars, 1.5 mm. increase was held; this indicates that 3.5 mm. of the original amount gained through treatment was lost. A permanent increase of 1.1 mm. across the mandibular first molars was held over the years, with 1.9 mm. of that gained through treatment lost. These figures show very

Fig. 9.



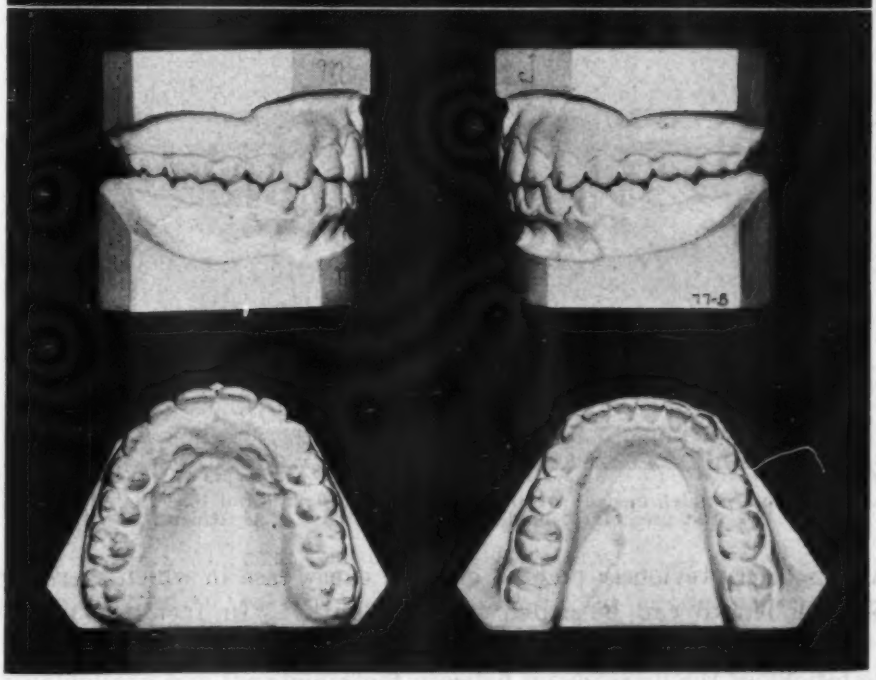


Fig. 10.

Fig. 9.—A Class II, Division 2 case in which the labial tipping of mandibular incisors was not indicated. (See text.)

Fig. 10.—The same case (see Fig. 9) at the end of treatment. The potentialities of this case were not such as to allow repositioning of incisors over basal bone through buccal expansion alone. (See relapse in next figure.)

definitely what one may gain and expect to maintain over the years through the use of expansion.

Changes in the inside and outside measurements, however, are even more interesting. We find upon comparing the original models with those taken eight and one-half years after retainers were discarded, that the inside measurement is 1.6 mm. *shorter* than it was when the case first presented for treatment. *The outside measurements in the two models are exactly the same.* Although some buccal expansion was held permanently, it was canceled out by relapse in the anterior segment.

This case illustrates very clearly my findings in regard to permanent dentition treatment in general, and it emphasizes the fact that we cannot arbitrarily say that the inside measurement may be increased in Class II, Division 2 cases. A permanent increase in this dimension may be obtained only when mandibular incisors have been tipped lingually from the outset and require uprighting through labial crown tipping.

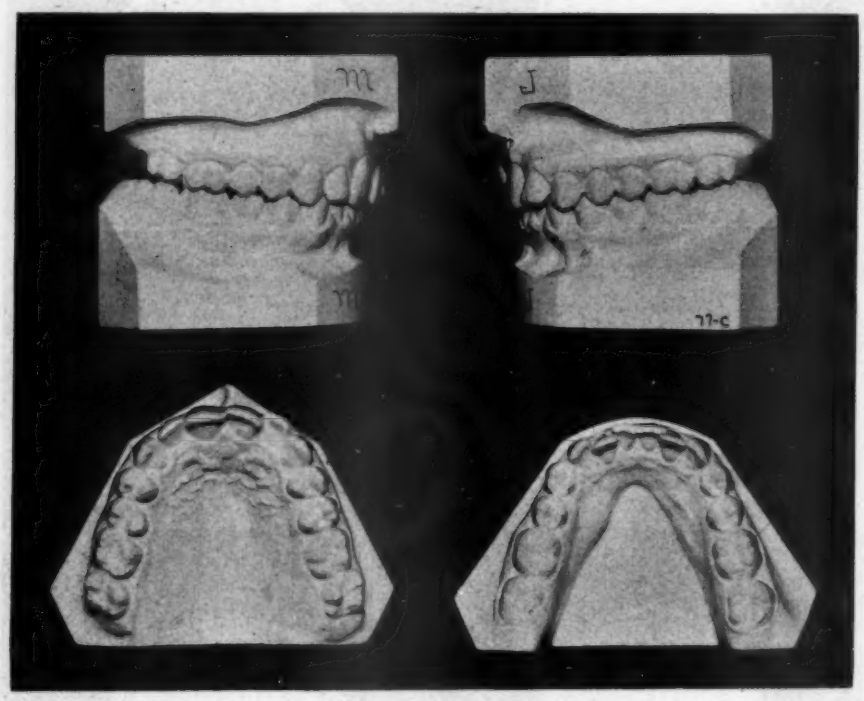


Fig. 11.—The relapse which ensued in the case shown in Figs. 9 and 10. The extraction of four first premolars should have been a part of treatment.

As has been previously pointed out, not every case in which there has been loss of arch length can be called "mesial drift." In fact, the majority of cases which have erroneously been called mesial drift are in reality only manifestations of the disharmony between tooth material and available supporting bone. True mesial drift, however, does occur when teeth have been lost, and it is possible in cases of bona fide mesial drift to restore mandibular first permanent molars to their proper positions. Such a case is shown in Fig. 12. The extent to which the mandibular left first and second permanent molars have

drifted, encroaching upon the space for the second premolar, is shown in the upper set of models. The models made upon the completion of orthodontic treatment, in which the left mandibular molars were moved distally to the extent indicated, are shown below. This case has been observed, out of retention, many years, and the distal movement of the mandibular left permanent molars has shown no relapse. The outside measurement in this case obviously has been increased, and the inside measurement, when measured on the left side, of course, also shows a permanent increase. This case is shown to emphasize that distal movement of molars has a favorable prognosis for a permanent result when there has been actual mesial drift; measurements on other cases in which mesial drift was not actually a factor show that distal movement is of no avail.

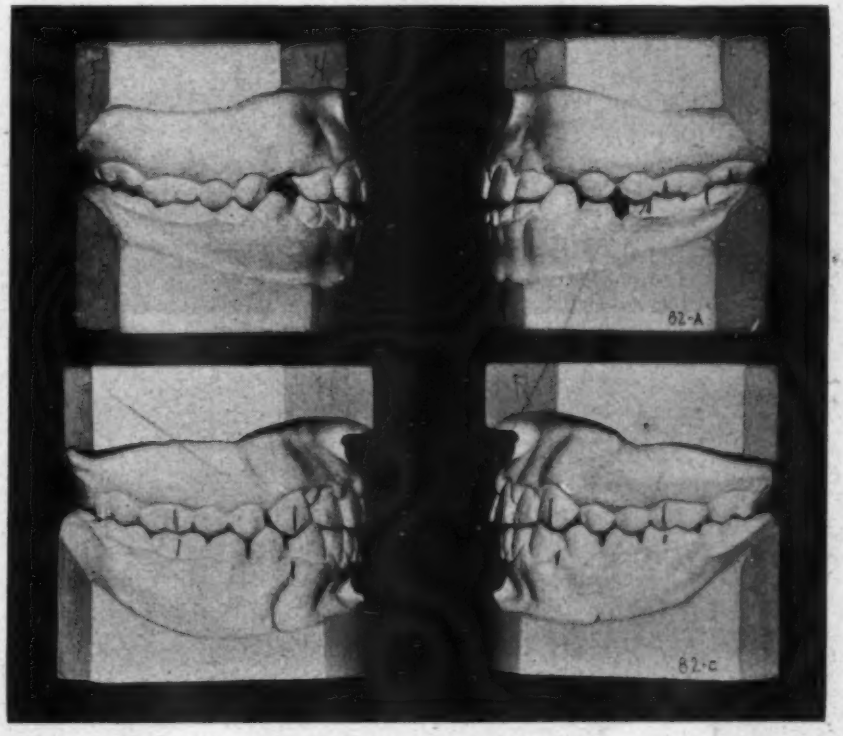


Fig. 12.—Showing that in certain cases molars may be moved distally with the expectation of a permanent result. This is a bona fide case of mesial drift. Upper models: before treatment; lower models: time of retention.

ARCH LENGTH AND EXPANSION

In the interest of accuracy, I have stated that expansion will serve to increase the outside measurement in such a way that this increase will be held. In so doing, I have run the risk of having my views concerning the use of buccal expansion in orthodontic treatment grossly exaggerated. It should not be concluded that I advocate a return to the day when buccal expansion was the panacea to be used in all cases where there were rotations or other manifestations of crowding in the mandibular arch. The only situations in which

Fig. 13.

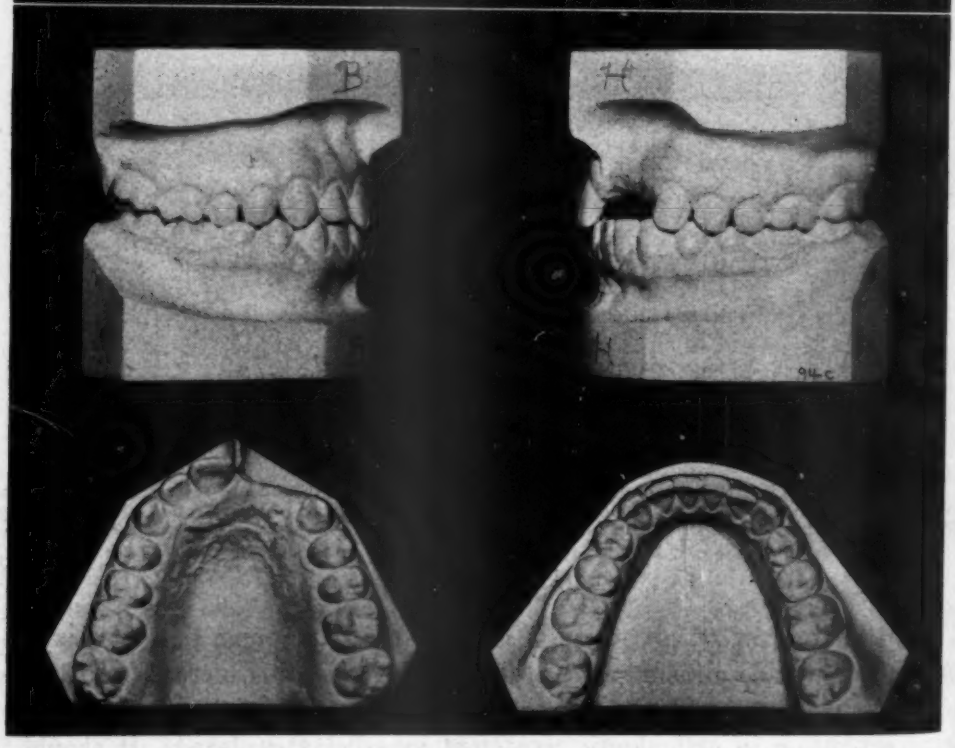


Fig. 14.

Fig. 13.—Buccal expansion was used in this case, with a stable result years later.

Fig. 14.—The case after it had been out of retention ten years. (See Fig. 13 and the text.)

Fig. 15.

Fig. 16.

Fig. 15.—A unilateral distoclusion which was treated with buccal expansion.

Fig. 16.—After four years of mechanical retention. The retention period in this case was deliberately extended to test its bearing on permanence of result.

buccal expansion may be utilized with the expectation of effecting permanent improvement are those in which basal supporting bone has adequate width and the contraction is confined to the alveolar bone. In these cases it is possible to move the canines, premolars, and molars buccally until they are satisfactorily situated over basal bone. The indiscriminate movement buccally of these teeth, when basal bone is itself narrow, offers no hope for success, but, on the contrary, courts certain failure. My measurements show that, even in malocclusions where buccal expansion is most clearly indicated, the results of expansion are usually pitifully inadequate; the greatest permanent increase in the outside measurement I have ever observed in my own practice as a result of buccal expansion has amounted to only 2.6 mm. The average amount is much less. So trivial an increase will suffice in only a few cases, and where a greater amount is required, buccal expansion is not the answer. The case in which the permanent increase of 2.6 mm. was obtained through buccal expansion alone is shown, prior to treatment, in Fig. 13, and, ten years after retentive devices were discontinued, in Fig. 14.

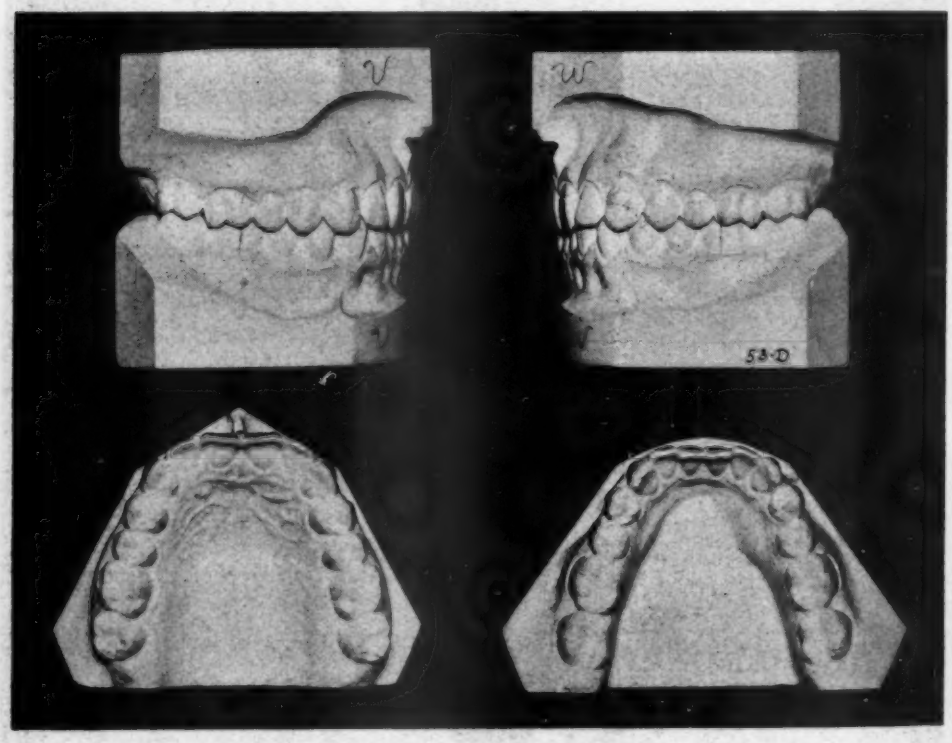


Fig. 17.—The relapse which ensued in the case presented in Figs. 15 and 16, in spite of four years of retention.

The malocclusion shown in Fig. 15 illustrates another aspect of the use of expansion as a means of increasing arch length. This case presented with a Class I relationship on the right side and a distal relationship of posterior teeth on the left side. The bite was closed and the mandibular anterior teeth were crowded and somewhat forward in relation to basal bone. There was a

Fig. 18.

Fig. 19.

Fig. 18.—A neutroclusion with marked forward inclination of mandibular incisors. As in the last case, buccal expansion was the basis of treatment and the retention period was long.

Fig. 19.—The end of active treatment in the case shown in the previous figure.

marked mesial-axial inclination of the crowns of the mandibular canines. Expansion was the only means available to get the anterior teeth back over basal bone. It was resorted to, and, after appliances were removed, retainers were worn no less than four years. I wanted to test my belief that long retention has no bearing on permanence of result. The status of the case after four years of retention is shown in Fig. 16. To what extent expansion was used in this case is shown in measurements. Comparing the models of Figs. 15 and 16 (beginning of treatment and end of retention), one finds that the width across the mandibular canines was increased 2.0 mm., across the mandibular first premolars 6.0 mm., across second premolars 5.2 mm., and across mandibular first molars 3.6 mm. There was no change in the inside measurement; the outside measurement showed an increase of 1.2 mm.

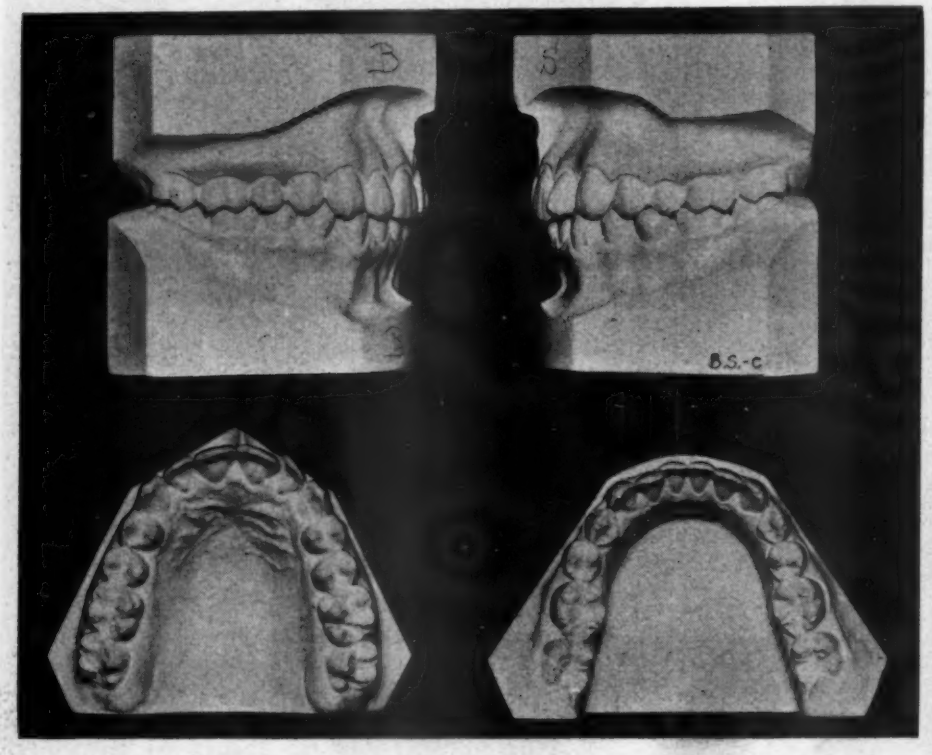


Fig. 20.—The relapse of the case shown in Figs. 18 and 19.

Fig. 17 represents the case six years after retainers were discarded. At this time, the intercanine width was 1 mm. greater than at the beginning of treatment. This shows that, during the postretention period, one-half of the expansion across the canines gained through treatment had been lost. Similarly, we find that the width across the first premolars was 4.6 mm. greater after the case had been out of retention six years than it was at the beginning of treatment, that is, 1.4 mm. of the increase gained in treatment was lost. Across the second premolars 4.0 mm. of the 5.2 mm. gained through treatment remained after six years out of retention, as did also 2.5 mm. of the 3.5 mm.

Fig. 21.

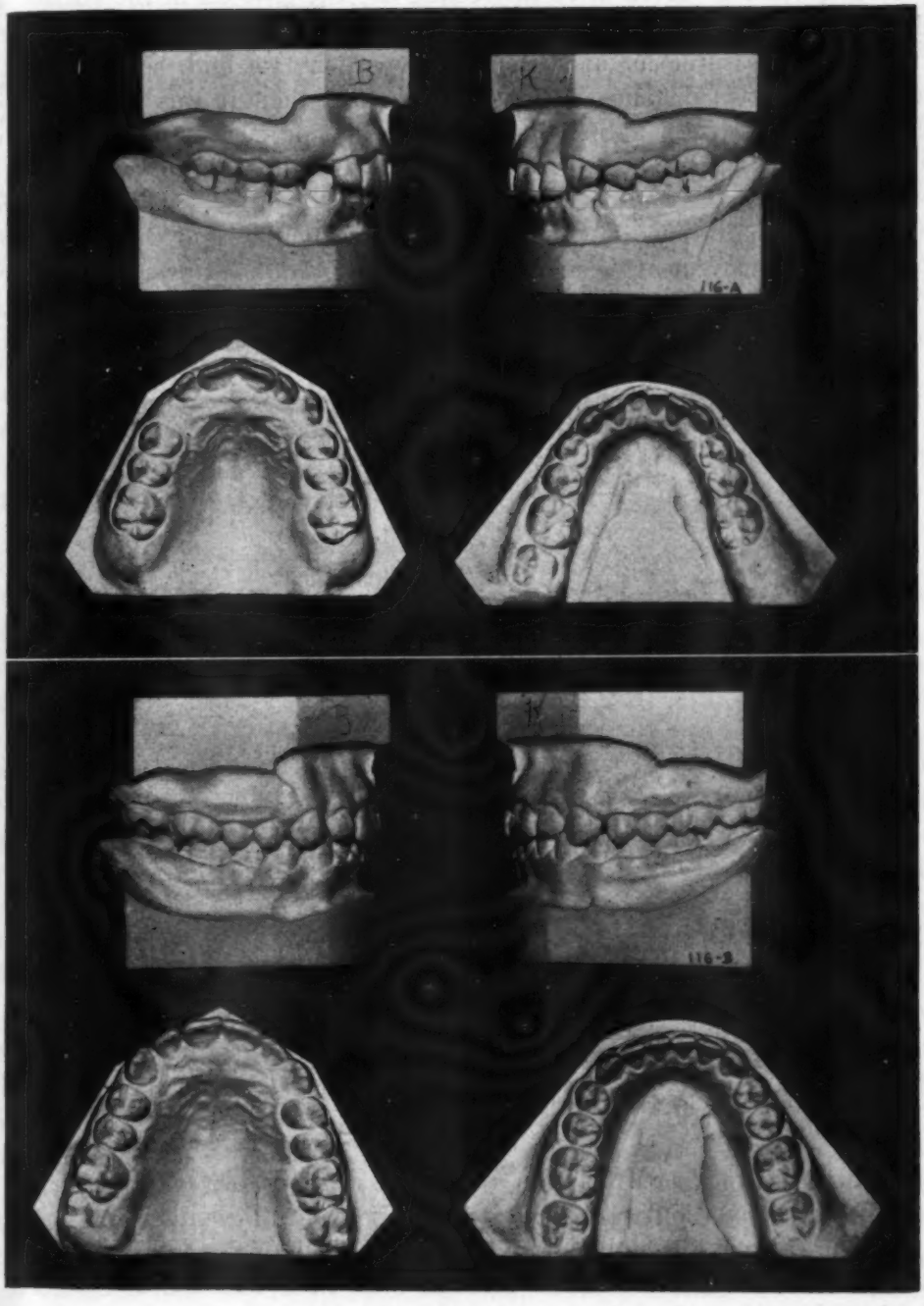


Fig. 22.

Fig. 21.—A deceptively "simple" case, which seemingly required buccal expansion.
Fig. 22.—The result of treatment involving buccal expansion.

gained across the first molars. These figures show that while some expansion may be held as a permanent result of treatment, by no means can all of it be expected to remain. Even more interesting are the changes in the outside and inside measurements. It will be recalled that there was no change whatsoever in the inside measurement at the end of retention; we find, six years out of retention, that this distance is now 0.9 mm. less than it was fourteen years previously when treatment was started. The outside measurement, which was increased 1.2 mm. in the course of treatment, held only 0.4 mm. of that increase after the case had been out of retention six years. This case illustrates strikingly the limitations imposed upon the orthodontist, and shows that after extensive tooth movement, even though the case is retained over a long period of time, he can expect little in the way of permanent alteration of the basic aspects of a malocclusion. Either the potentialities are there, or they are not.

Fig. 23.—The relapse in the case in which buccal expansion was not the answer. (See Figs. 21 and 22.)

Fig. 18 shows a neutroclusion case with marked forward tipping of the maxillary and mandibular anterior teeth. If the full complement of teeth is to be preserved, the only means by which the labial-axial inclinations of anterior teeth can be corrected is through what little increase in room can be gained through buccal expansion. Such a plan of treatment was followed in this case, and its results may be seen in Fig. 19. Retainers were worn by this patient, after the removal of active appliances, for four and one-half years. This is the longest that I have ever required a patient to wear retainers. Here again, long retention was being tested, and, in spite of it, within a few months

after the removal of retainers the relapse shown in Fig. 20 had taken place. Results such as these clearly show the limitations of expansion, and also show that unduly prolonged retention has no bearing on ultimate success or failure.

In Fig. 21, we see a deceptively "simple" case that gives no inkling of the disappointment which may follow treatment. Fig. 22 shows the case at the conclusion of active treatment, in which buccal expansion was used to position the mandibular incisors over basal bone. I believe that this satisfactory positioning was accomplished, but at the expense of too much buccal expansion. The consequences of expecting too much from expansion are shown in Fig. 23, models made after the case had been out of retention a few years. As was shown by detailed measurements in previous cases, here again overexpansion ultimately resulted in the collapse of the mandibular anterior segment. Some might say that they would be satisfied with such a result as that shown in Fig. 23. I, personally, am not; I should think that anyone who would be satisfied with a result like this would also be satisfied with the case when it presented for treatment and would decline to treat it. This case is shown to illustrate that expansion is not to be entirely relied upon, even in so-called "easy" cases.

ILLUSTRATING RECOMMENDED PROCEDURES

It would be possible for me to show dozens of cases, observed for years after retainers were discarded, in which stable results were achieved without the removal of teeth; but even a far greater number might be shown, which, not having had adequate basal support from the start, relapsed. Many extraction cases might also be shown which have remained stable over the years. However, it is not possible for me, and I believe it is possible for no one, to show results in difficult, crowded cases which have held satisfactorily when extraction was not a part of the treatment. Since it is not desirable to add to an already large number of illustrations, and since it is not the purpose of this paper to show a great number of cases which have remained stable for many years because of inherent potentials, nor complex cases which have been benefited by extraction, reports of both types have been held to a minimum.

While the extraction of teeth has increasingly become a part of orthodontic treatment in recent years, I feel that the statement of Badcock[3] is as timely today as it was when it was written twenty years ago: "Too little attention has been given to scientific extraction. We have still much to learn as to the conditions which demand it, the age to adopt it, and which teeth to extract in order to arrive at the result which we wish to obtain." I shall attempt in this paper partially to answer Badcock's plea by showing that the conditions which demand extraction are numerous, and that there exist sound principles upon which we may rely in determining which teeth to extract.

I should be shirking plain duty if I were to fail to point out that extraction as an adjunct to orthodontic treatment is hardly new, and that it requires less courage to advocate it today than in times past. Long ago Case, Grieve, and others were pointing out the indications for extraction, and were being poorly thanked for their pains. When Tweed offered, along with other

things of merit, a systematic basis for utilizing extraction, he met with opposition which would have subdued men with less perseverance and conviction.

It is appropriate, then, to consider briefly at this time the question "Does extraction have a place in orthodontic therapy?" a question which appears so frequently in orthodontic literature and is so often a subject of discussion at meetings. I, for one, would suggest a moratorium on that question since its discussion has reached the point of diminishing returns. The most extreme among those who look upon the removal of teeth with disfavor now admit that at times they extract "when it is absolutely necessary." As an aside, one might remark that this is scarcely a satisfactory answer, since no advocate of the opposite extreme would recommend knowingly an "unnecessary extraction." Presumably the answer to the question is a hearty "Yes!" and the infinitely more difficult ones of "When?" and "In what cases?" should next occupy our attention and disturb the complacency of orthodontic meetings.

FOUR FIRST PREMOLARS—THE ONLY CHOICE?

While the removal of the four first premolars seems to me a step in the right direction, in that it is a recognition of the essential limitations placed upon orthodontic treatment, at the same time the routine designation of these particular teeth for removal is not justified. Some orthodontists select teeth other than first premolars for extraction when such teeth are carious or contain large or doubtful restorations. Quite properly, such factors should be considered, yet not always should they dominate the decision, for there are other important considerations to be taken into account.

The decision as to which teeth should be removed in the malocclusion shown in Fig. 24 was not a difficult one. In this case, all four second premolars were congenitally absent. It was a Class I malocclusion with a slightly closed bite and a forward relationship of mandibular incisors to basal bone. The maxillary right second deciduous molar had been lost at the time the girl presented for treatment and the remaining three deciduous second molars were extracted. Fig. 25 shows the case at the time the appliances were removed and retainers placed. The removal of the deciduous teeth made room for repositioning the remaining permanent ones, and space closure was effected mainly through the mesial movement of molars, after the anterior teeth were rotated and normally placed over basal bone. Unfortunately, I have not been able to obtain models showing the case after a long postretention period, but the x-rays indicate that all four third molars have every prospect of coming into occlusion.

In the previous case, the orthodontist was given no choice in the matter of which teeth to remove. Fig. 26 shows a situation in which the extraction of the four first premolars would have been ill-advised, yet the removal of tooth structure from both arches was definitely indicated.

In treatment, after one removes first premolars, the six anterior teeth are pitted against the second premolars and molars. Accordingly, the removal of *first* premolars is good practice when mesial movement of buccal teeth is to be minimized. On the other hand, when the *second* premolars are removed, mesial

movement of the molars is pitted against the first premolars plus the six anterior teeth, and thus mesial movement of molars is facilitated. It is upon this basis that one should decide whether to remove first premolars or second premolars.

Fig. 24.

Fig. 25.

Fig. 24.—A case presenting with the congenital absence of four second premolars.

Fig. 25.—The same case (see Fig. 24) after removal of deciduous teeth and closure of spaces. Note that mandibular anterior teeth are upright over basal bone.

In the case shown in Fig. 26, lingual tipping of the mandibular anterior teeth beyond their upright positions would have been difficult to prevent had first premolars been extracted; consequently, mandibular second, instead of first, premolars were removed. In the maxillary arch, first premolars were removed

Fig. 26.

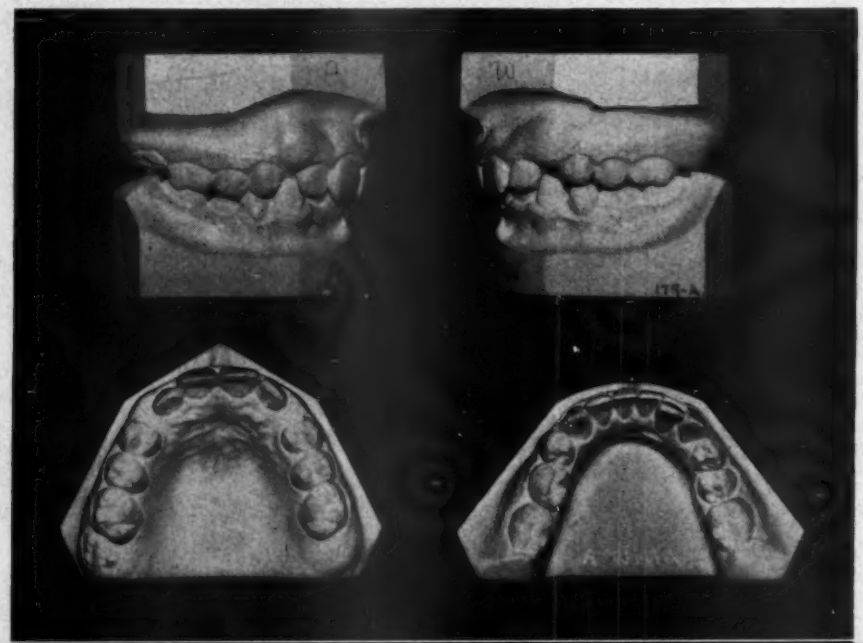


Fig. 27.

Fig. 26.—This case required not the removal of four first premolars, but maxillary first premolars and mandibular second premolars. (See text for explanation.)

Fig. 27.—The result of treatment, at time of retention, of the case shown in Fig. 26.

in order to make room for the maxillary canines which soon would have attempted to erupt into spaces inadequate to receive them. The result of treatment at the time of retention is shown in Fig. 27. Note that in treatment the mandibular anterior teeth were not tipped lingually of their upright positions.

One might think, upon superficial examination, that this is a rather easy type of case to treat and wonder why it was necessary to resort to extraction. But, upon more thorough study, there are in evidence several conditions which would undoubtedly work against a successful outcome in treatment without the subtraction of tooth structure. These conditions are:

1. The full buccal width of the arches seemed to be already present; therefore, very little, if any, increase in arch length could be obtained through buccal expansion.

2. The mandibular incisors were not only slightly crowded but were also tipped forward of their normal axial positions as related to their basal bone support.

3. The maxillary buccal segments were forward of their normal positions in the arch, thereby occupying a portion of the canine spaces. The distal movement of these buccal segments would have required the extensive wearing of Class II elastic ligatures and this would have accentuated the forward tipping of the mandibular incisors; we often speak of stationary anchorage, but I do not believe it can be obtained.

Two cases will now be presented in both of which there was congenital absence of mandibular second premolars. Both illustrate errors in treatment planning. In one it was correctly decided that maxillary second premolars should not be removed (for reasons to be explained), but treatment of the case was begun too early. In the other, maxillary second premolars should have been removed, but were not.

In Fig. 28 is shown the first case, in which treatment was begun too soon. The deciduous second molars were removed and closure of the spaces was effected without carrying the mandibular anterior teeth beyond their upright positions. The case as it appeared at the end of treatment may be seen in Fig. 29. Since treatment of this case was not planned to terminate coincidentally with the eruption of mandibular third molars, the maxillary second molars erupted below the level of the occlusal plane, making it necessary to remove these teeth. If I were to treat another case like it today, I would deliberately delay treatment in order to have it end coincidentally with the eruption of the mandibular third molars, thereby providing occlusion for the maxillary second molars. The extraction of these maxillary second molars was necessary in this case to recover a situation which should have been avoided in the first place. The result is shown in Fig. 30, several years after all retentive devices had been discarded. Recent x-rays indicate that the maxillary third molars have come forward and will occlude with the mandibular third molars when those teeth erupt (Fig. 31). The extraction of the maxillary second premolars was avoided in this case because such a procedure would have been harmful to facial esthetics. The fact

Fig. 28.

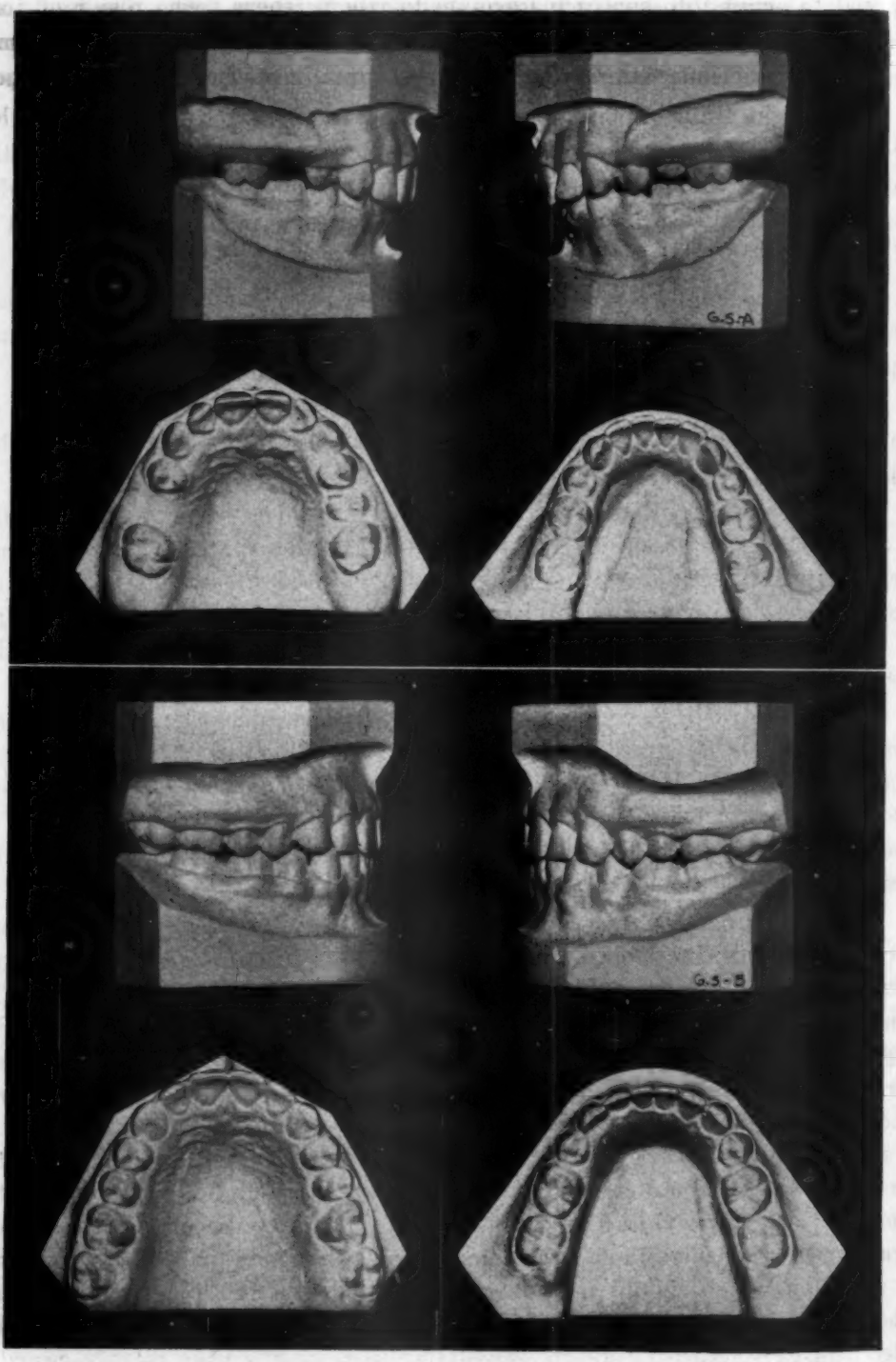


Fig. 29.

Fig. 28.—A malocclusion presenting with congenital absence of mandibular second premolars.

Fig. 29.—The result of treatment, at time of retention, of the case shown in Fig. 28. Maxillary second premolars were not removed to correspond with the congenitally absent mandibular teeth. (See text.)

that spaces may be closed without tipping teeth into the spaces and without subsequent reopening of contacts is demonstrated by the final models, and the corresponding x-rays (Fig. 32).

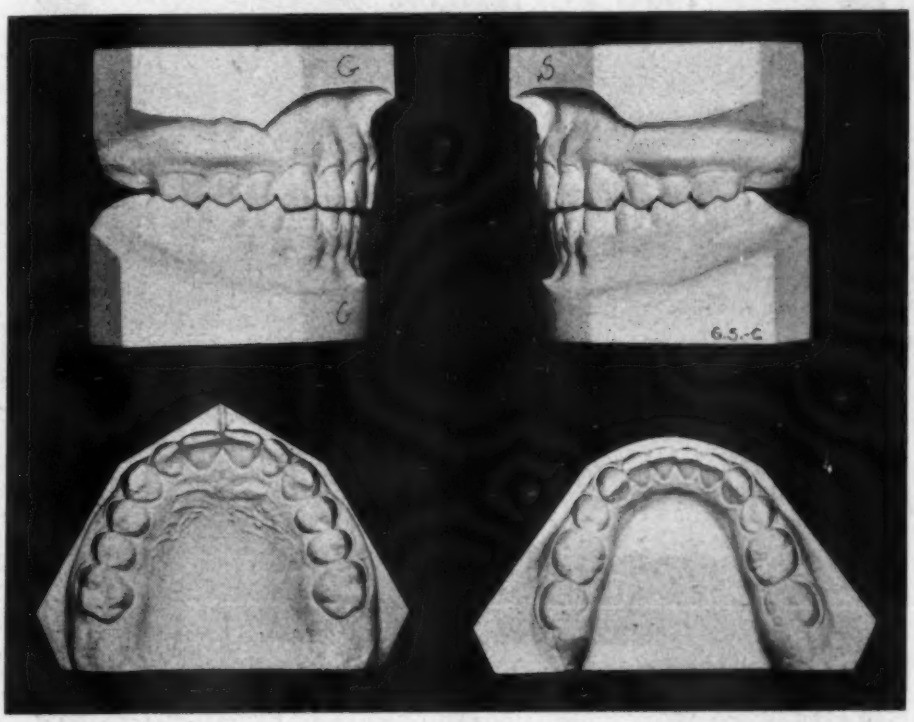
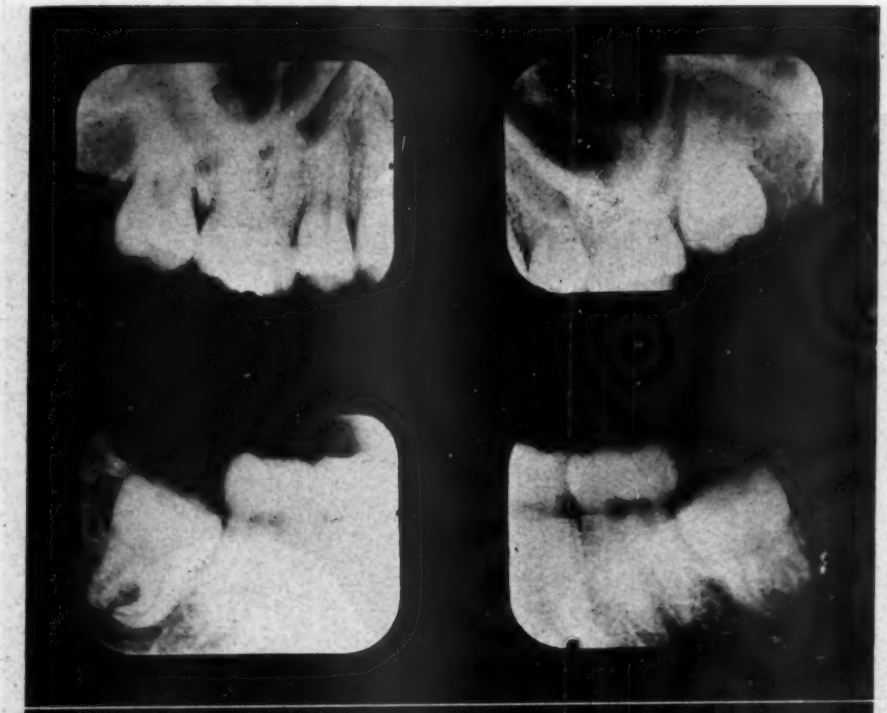


Fig. 30.—The case shown in Figs. 28 and 29, several years after retentive devices were discarded.

The preceding case and the next one, alike in that both presented with congenital absence of mandibular second premolars, afford interesting comparison. The treatment of the second case, shown as it presented in Fig. 33, was timed so that the eruption of the mandibular third molars came at the end of treatment, thereby preventing the extrusion of maxillary second molars which occurred in the previous case. Although no teeth were removed, except the mandibular second deciduous molars, I am now certain that it would have been advisable to remove the maxillary second premolars to correspond with the deficiency in tooth structure in the mandibular arch. There was crowding in the maxillary anterior segment, and this would have been relieved by moving the anterior teeth and the first premolars distally. The closure would then have been completed by mesial movement of the molars. No such crowding obtained in the previous case (Fig. 28), and there was already a tendency for the maxillary anterior teeth to tip lingually, which I did not wish to enhance. Accordingly, the removal of tooth structure from the maxillary arch in the previous case was not indicated; the maxillary arch of this second case, however, should have had such treatment, since the crowns of the anterior teeth required lingual movement. Fig. 34 shows the case several years after retentive devices were discontinued.

Fig. 31.



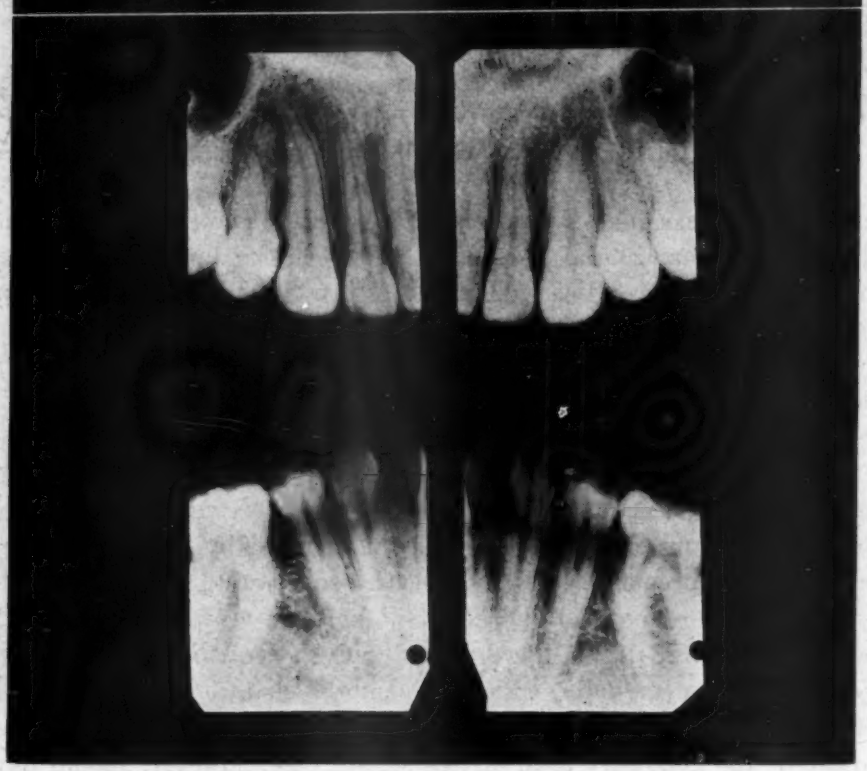


Fig. 32.

Fig. 31.—Recent x-rays of third molar areas of the case shown in Figs. 28 to 30.

Fig. 32.—X-rays of the premolar-canine areas of the patient shown in Figs. 28 to 31. Note that spaces have been closed without tipping teeth into spaces. Retainers have not been worn for several years.

Fig. 33.

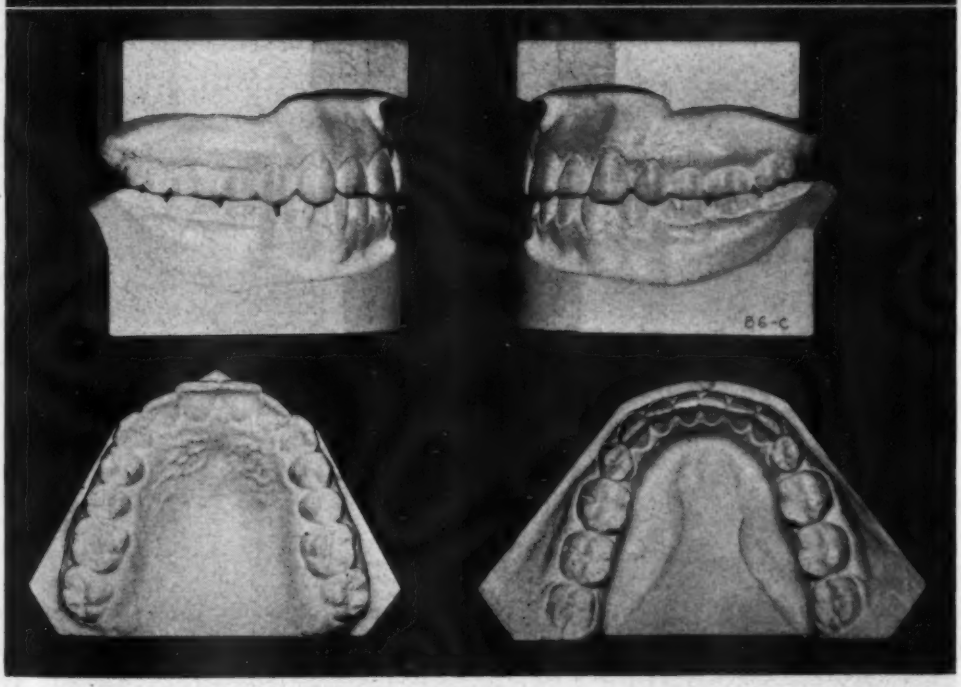


Fig. 34.

Fig. 33.—Another case presenting with congenital absence of mandibular second premolars. This case affords interesting contrast with the previous one. (See text.)

Fig. 34.—The result of treatment (see Fig. 33) several years out of retention. A better result would have been obtained had maxillary second premolars been removed. (See text.)

Fig. 35.

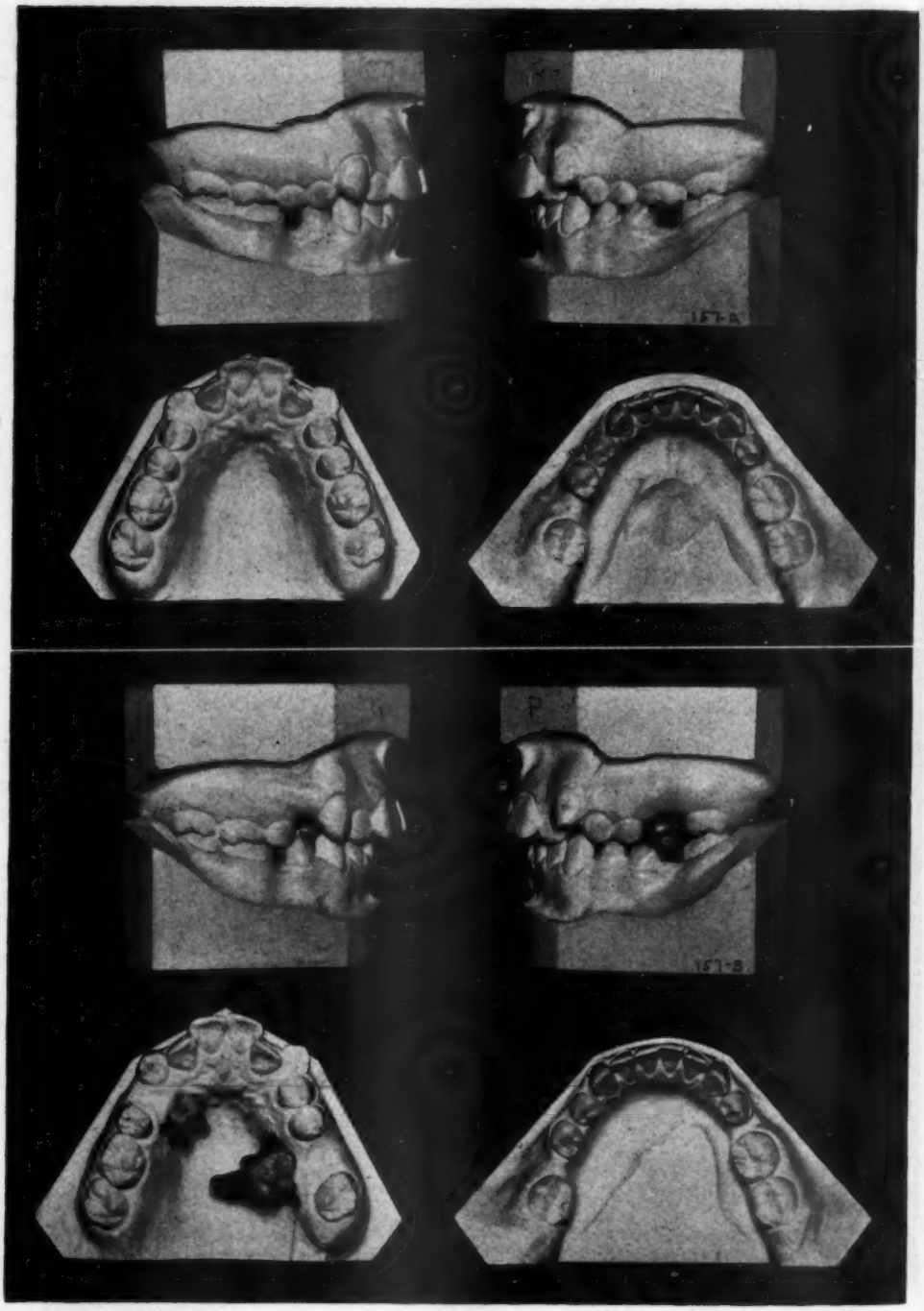


Fig. 36.

Fig. 35.—Showing a case presenting with loss of teeth due to caries.
Fig. 36.—The case shown in Fig. 35, after extraction.

Teeth damaged, or lost, due to dental caries frequently challenge the orthodontist's ingenuity in treatment planning. Fig. 35 shows a case in which the mandibular right second premolar and the mandibular left first permanent molar had been lost due to caries. Fig. 36 shows models of the case after the compensatory extractions were performed. These teeth were the maxillary right first premolar and left first permanent molar. The removal of the maxillary right second premolar to compensate for the loss in the mandibular arch would not have been wise, since that would have entailed the distal movement of too many teeth, with insufficient anchorage on that side. The result at the time of retention is shown in Fig. 37.

Fig. 38 shows the models of a young patient (9 years, 9 months of age) for whom the removal of four first premolars was indicated. It was a neutroclusion case with protrusion of the mandibular and maxillary anterior teeth.

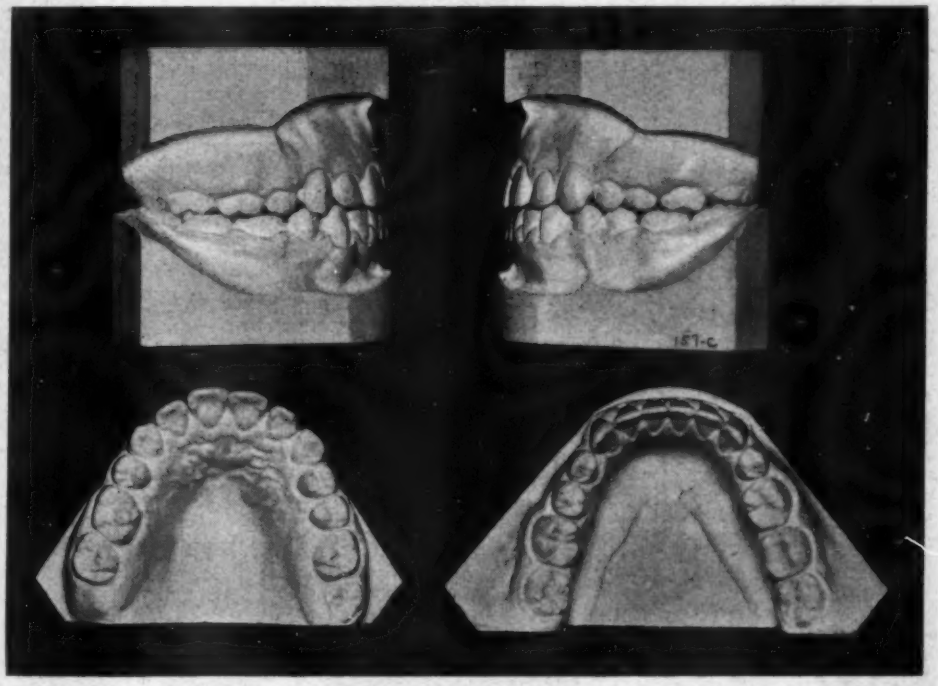


Fig. 37.—The result of treatment, at time of retention, of the case shown in Figs. 35 and 36.

As has been previously said, buccal expansion provides the only means by which protrusion of mandibular anterior teeth may be premanently corrected without extraction. It was evident that expansion would not suffice in this case. Treatment, after the removal of the four first premolars, was begun in April, 1938, at the time when other men who were advocating removal of teeth in treatment were also advocating waiting until the fifteenth or sixteenth year before performing such extractions, in order that "growth potentialities be given an opportunity to assert themselves."

Fig. 38.

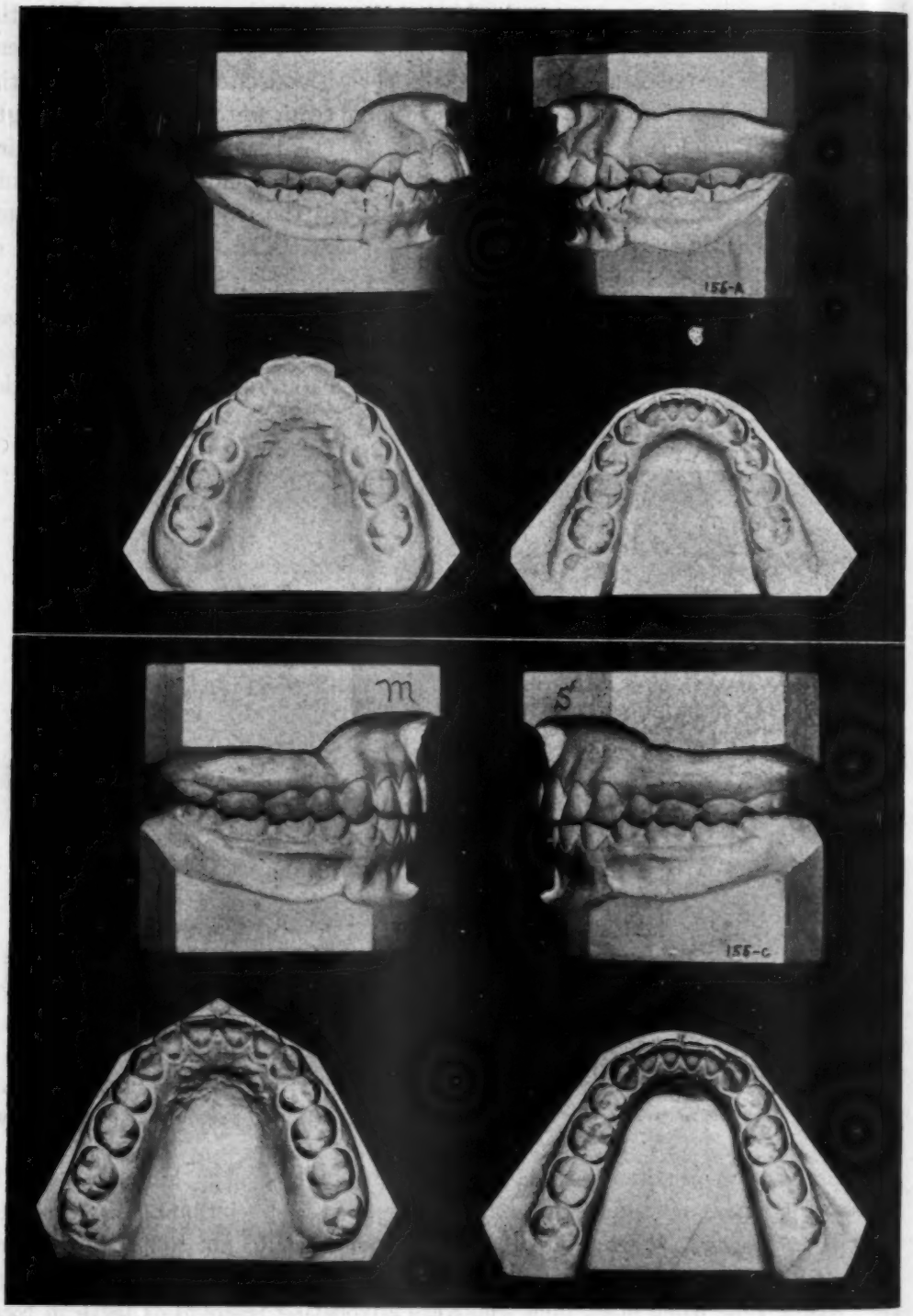


Fig. 39.

Fig. 38.—Extraction was required in this case because buccal expansion alone would not have allowed for the repositioning of mandibular anterior teeth to upright positions over basal bone.

Fig. 39.—The case shown in Fig. 38, four years after mechanical retention was discontinued. Note that spaces are closed and axial inclinations are normal.

Fig. 39 shows the occlusion four years after all mechanical retention had been discontinued. All contact points at the sites of the extractions, and elsewhere, are closed, and the teeth adjacent to the extraction spaces are not tipped toward one another. Additional evidence on these two points is provided in the x-rays shown in Fig. 40.

Fig. 40.—X-rays of the case shown in Figs. 38 and 39. Note that teeth have not been tipped toward one another in the closure of spaces, and that spaces are closed. These films were taken four years after retention was discontinued.

Two undersirable consequences of extraction in orthodontic treatment—the tipping of teeth into spaces created by extraction and a failure to close contact points satisfactorily—have been encountered so frequently that some men believe they are inevitable. Clinical observation in cases such as the last one, and many others like it, indicates that the frequent failure to close spaces satisfactorily is due not to any inherent limitations in the tissues, but rather to inadequacies of treatment. In my opinion, many of the spaces which remain, after treatment involving the removal of teeth, are due to tipping anterior teeth too far lingually. If mandibular anterior teeth are tipped lingually beyond their normal upright axial inclinations over basal bone, environmental forces (presumably those exerted by the tongue) will reposition them in their proper situations. This can result only in spaces and lack of proper contacts throughout the arch. A better plan is to carry the mandibular canines and incisors *bodily* only to desirable positions over basal bone, not *tipping* them beyond that position. Any remaining spaces should be closed by means of mesial movement of buccal

teeth. Labial torque in the anterior section of the arch wire prevents tipping of incisors in this process. It is very difficult to move mandibular incisors too far lingually if they are maintained during movement in upright positions. As has been stated, in many cases this is achieved more readily by removal of mandibular second premolars instead of first premolars. Furthermore, in many extraction cases, I deliberately refrain from banding second molars, so that first molars may be more readily brought forward. The second molars usually tip mesially as they follow the first molars forward. They should be banded and uprighted just before retention. The establishment of mass anchorage in the buccal segment is indicated only when needed; when it is not needed it may interfere with the attainment of a more nearly ideal result.

THE PROBLEM OF FACIAL BALANCE

Earlier in the paper, I showed how my serial measurements of treated cases led me to conclude that the orthodontist's ability to increase the inside and outside measurements was definitely limited. I stated that the outside measurement might be increased by buccal expansion, although the maximum amount obtained by the author has been 2.6 mm. In order to set up a generalization concerning the inside and outside measurements, it is necessary to recognize certain exceptions which are essentially local disturbances rather than manifestations of disharmony between tooth structure and basal supporting bone. I have said that both inside and outside measurements may be permanently increased in permanent dentition cases when the case presents for treatment with mandibular incisors tipped lingually due to a closed bite, or when the case has sustained a premature loss of deciduous tooth structure, with a consequent shifting of teeth in alveolar bone. Finally, I also said that the generalization applies only to cases having good facial balance after treatment. In other words, there are a few cases, orthodontically produced "double protrusions," in which one may find a permanent lengthening of both inside and outside measurements. The majority of protrusive cases, however, relapse so that the forward relationship of maxillary and mandibular incisors to their respective bony bases is only transitory, with a consequent shortening of both inside and outside measurements after the case is released from mechanical retention.

Two cases will now be contrasted to elucidate my views concerning facial balance, and how esthetics is related to the preservation of the integrity of the dental arches. Treatment of both cases was begun at approximately the same dental age. Each presented with a facial profile which might have been improved through a reduction of the prominence of the lips. In one case no teeth were extracted, and no improvement in the facial profile was obtained. Tooth alignment has remained intact and without relapse, however, several years after retaining devices were removed. In this case, both inside and outside measurements were increased, and it is safe now to assume that the increase will be permanent. In the other case, four first premolars were removed; models of the case several years out of retention are shown here which indicate that it is a

Fig. 41.

Fig. 42.

Fig. 41.—A case requiring uprighting of anterior teeth over basal bone, in which extraction should have been, but was not, a part of treatment.

Fig. 42.—The case shown in Fig. 41, several years after retention was discontinued. Although uprighting and lingual positioning of anterior teeth were not fully accomplished, there has been no break in the dental arches. The four first premolars should have been extracted.

permanent, stable result.* Improvement in the facial profile was achieved through treatment. Let us compare the two cases.

The one in which extraction was not resorted to is shown at the beginning of treatment in Fig. 41, and several years after retainers were discarded in Fig. 42. The facial profiles, before and after treatment, are shown in Fig. 43.

Fig. 43.—Profile photographs of the case shown in Figs. 41 and 42, before treatment and at the end of treatment. No improvement in facial balance was achieved.

Fig. 44.—A case similar to the one shown in Figs. 41 to 43, but in which the four first premolars were extracted.

*Treatment planning and treatment by Dr. Cecil C. Steiner and the author.

The other case is shown at the beginning of treatment in Fig. 44, and several years after retention was discontinued in Fig. 45. The facial profiles, before treatment and at time of retention, are shown in Fig. 46. These two cases were sufficiently similar at the beginning of treatment that they may be compared profitably. I realize that the appraisal of success with respect to changes in facial balance is more often a matter of opinion than is any other factor of treatment. It is my opinion that the case in which subtraction of dental units

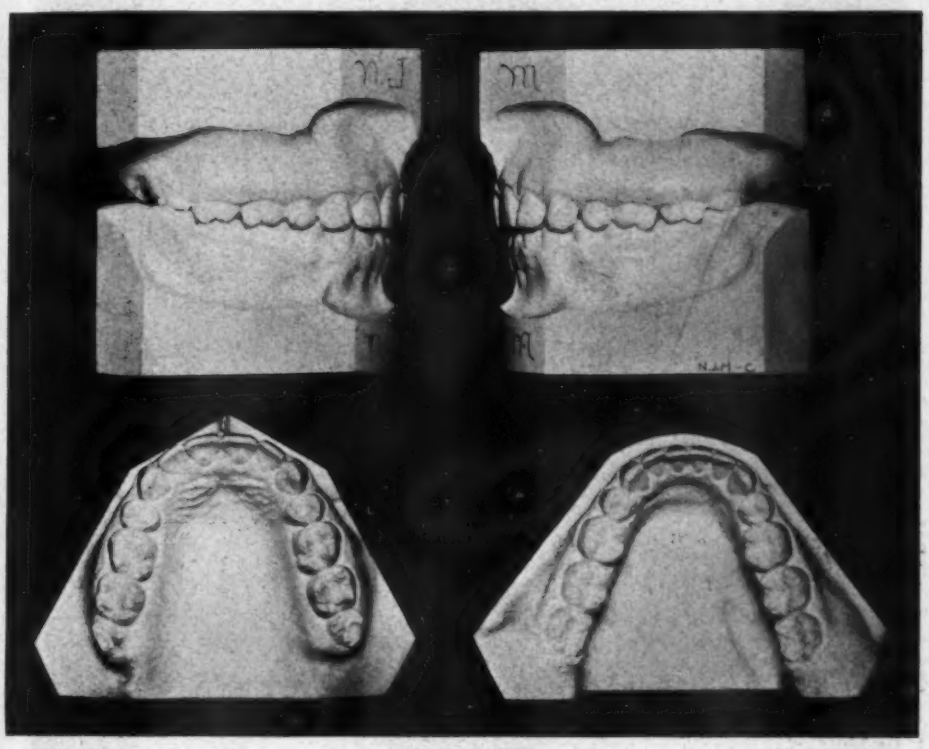


Fig. 45.—The case shown in Fig. 44, several years after retainers were discarded.

Fig. 46.—Profile photographs, before treatment and at time of retention. (See Figs. 44 and 45.)

Fig. 47.

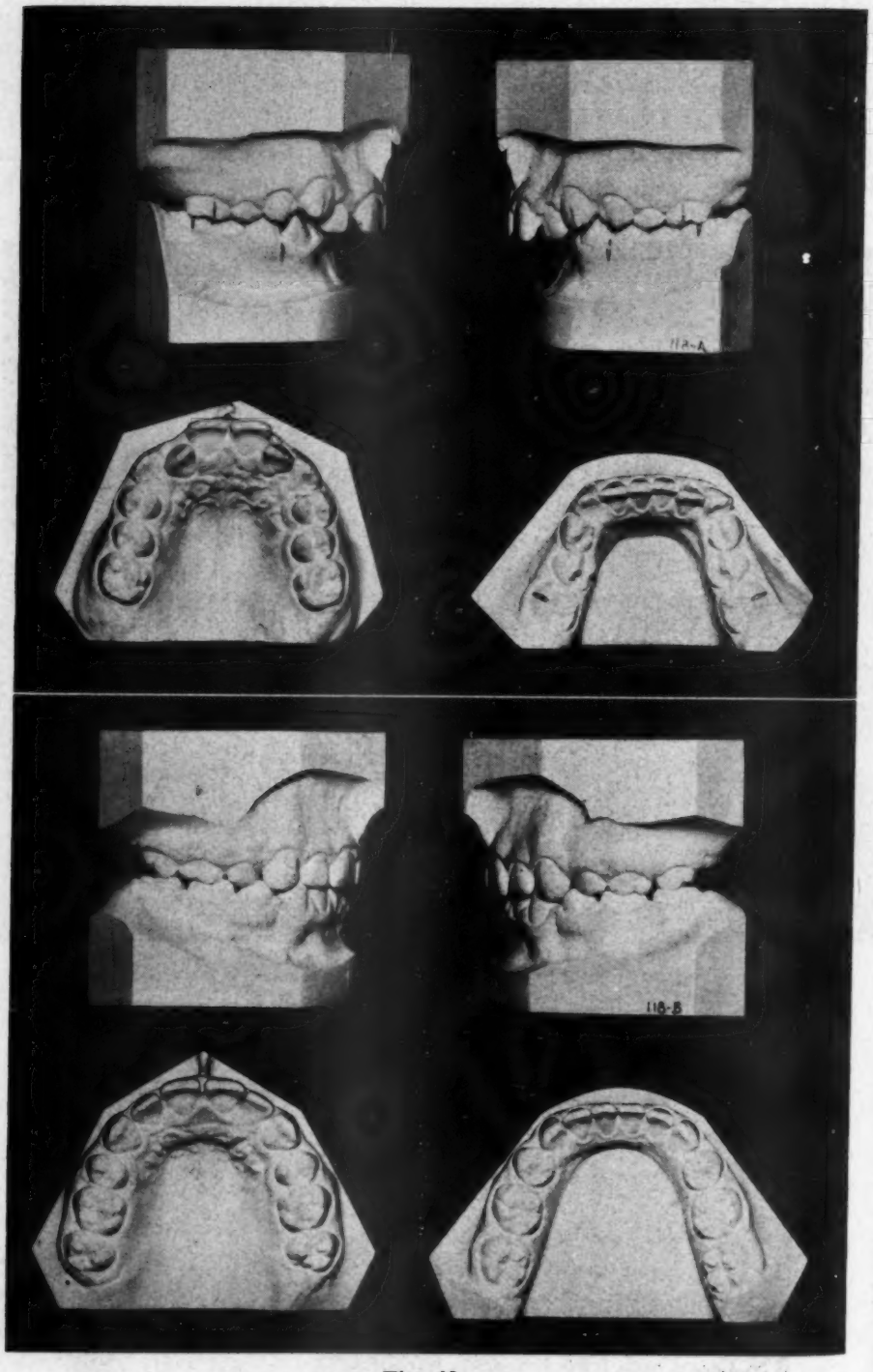


Fig. 48.

Fig. 47.—A case requiring the extraction of four first premolars. (See text and next two figures.)

Fig. 48.—The case shown in Fig. 47, at the end of treatment.

was performed shows a more gratifying result, following treatment, than does the other. I believe that the number of orthodontists who share that opinion is steadily increasing. We can only hope that constructive criticism of one another's cases, openly shown and openly discussed, will lead to an era of greater agreement as to what constitutes facial balance and good esthetics in this highly important sphere of our activities.

Fig. 47 shows a Class II, Division 1 case which is not entirely typical of that class. The case was treated after the removal of the four first premolars, and the result, at the end of active treatment, is seen in Fig. 48. It is included in this report simply to show the stability of the result which may be obtained in extraction cases without any retainers whatsoever, when planning and execution of treatment are properly carried out. Fig. 49 shows the case one year after bands were removed. No retainers of any sort have ever been worn by this patient.*

Fig. 49.—The case shown in Figs. 47 and 48, one year after bands were removed. No retainers have ever been worn by this patient. Note closure of band spaces.

Another case in which proper treatment planning called for the closure of space is shown in Fig. 50. The congenital absence of the mandibular left second premolar was disclosed by x-rays. This tooth, of course, was removed. It was decided that the maxillary left second premolar be removed as well, to correspond with the condition in the mandibular arch. This unilateral closing case was begun in December, 1923. The last models, made in 1940, are shown

*While I have omitted retention in a few extraction cases to determine the outcome, I do not recommend it as routine procedure. On the contrary, I believe that special precautions are advisable.

Fig. 50.

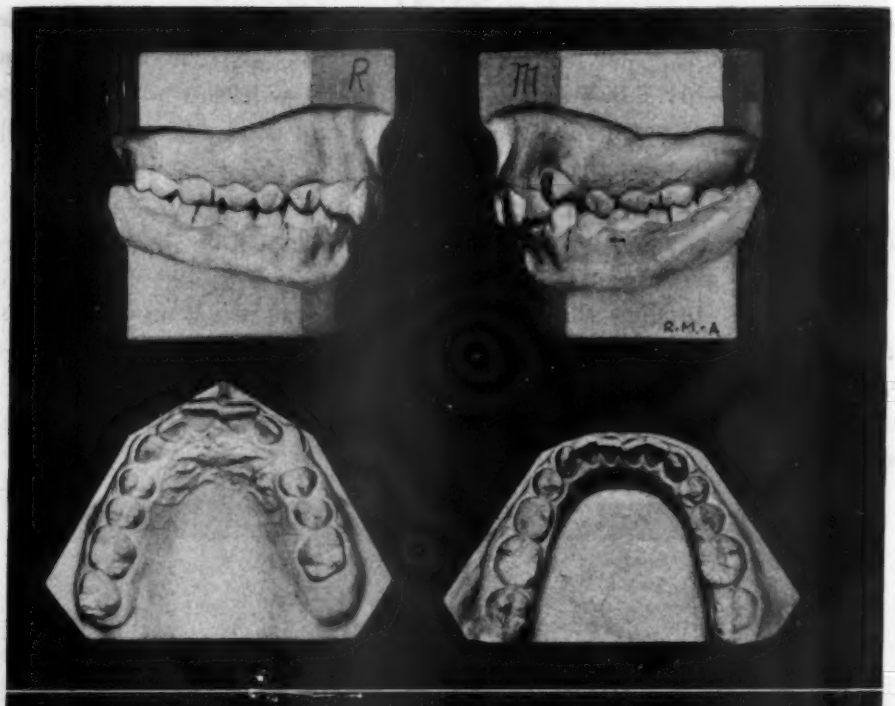


Fig. 51.

Fig. 50.—An extraction case undertaken by the author as early as 1923. The mandibular left second premolar was congenitally absent; the maxillary left second premolar was removed. Space closure was unilateral.

Fig. 51.—The case shown in Fig. 50, as it appeared in 1940, many years out of retention.

in Fig. 51. Obviously, this case has been without retainers for many years. The reader will note that there is no space remaining at the site of the extraction in either the maxillary or mandibular arch. This case is cited to remind the reader that extraction is not a new procedure in orthodontics. Although the difficult task of closing spaces unilaterally without changing the midline was accomplished satisfactorily, I would today avoid that difficulty by removing the second premolars of the opposite side as well. However, facilitating treatment is not the only justification for such a decision. The third molar of the mandibular left side came into occlusion nicely, and undoubtedly the mesial movement of the left first and second molars in treatment allowed this. On the right side, where first and second molars were not moved mesially, it was later necessary to remove the third molar which was impacted. Unfortunately, the mandibular left third molar was lost in later years due to dental caries.

WHAT CAUSES RELAPSES?

All orthodontists are prepared, I believe, to accept the familiar statement that the positions occupied by the teeth represent a balance of forces at work upon those teeth. In other words, whether the teeth are in normal occlusion or in malocclusion, they are controlled by influences which are in equilibrium with one another. The recognition of this truism is important because it stresses the fact that teeth will move at any age, if even light forces are present to disturb the balance. Regardless of how sound this statement may be as a general principle, it remains incomplete, since it leaves unexplained how forces specifically disturb the equilibrium when a treated case relapses. What force or forces transcend the others so that an evenly aligned mandibular anterior segment collapses after retainers are finally discarded? What undesirable influences work against the orthodontist when the bite closes after it has been opened through treatment?

One commonly heard explanation for the relapse of mandibular incisors is the forward pressure of the erupting mandibular third molars. Most orthodontists are inclined to accept this explanation, largely because the relapse of treatment cases is so frequently coincident with the eruption of these molars. If the precaution of removing third molars were always rewarded by a stable result, forward pressure of these teeth might satisfactorily explain relapse. But it is common knowledge that relapse of treated cases frequently occurs after the removal of third molars and even in cases where they are congenitally absent. Until clinical observation more consistently supports the contention that third molars are responsible for relapse, we must seriously consider the possibility that the third molars happen to erupt, or attempt to erupt, at an age which coincides with the age at which retainers so frequently are discarded, and that they have always been "innocent bystanders" in a situation in which they have had no active role.

We hear no less frequently the statement that habits of various sorts are responsible for relapse. It is true that faulty deglutition sometimes causes open-

bite, and that tongue thrusting may also cause an open-bite in the anterior segment, and even occasionally in the posterior part of the mouth. Buckling of the mandibular anterior segment is not to be explained away, I am certain, on the basis of habit. In my opinion, sleeping habits are particularly overexaggerated as causes of relapse. Others who have stayed awake, as I have done, to observe children through an entire night's sleeping period will bear me out when I say that children do not occupy one position very long at a time.

Most significant of all, however, is the fact that as soon as the orthodontist adopts the practice of removing teeth as a part of his treatment procedures, his cases generally remain stable. The problem once blamed upon habits usually disappears, barring the occasional open-bite case which may be attributed to faulty tongue position or function.

My measurements upon models taken at different stages before and after treatment show that mandibular teeth come ultimately to positions wherein they are in equilibrium with the forces upon them. Obviously, these teeth play only a passive role in this repositioning. What these forces are which shift teeth after treatment, thereby producing what we call relapse, is not for me to say. I believe my evidence is sufficient to establish the fact that these phenomena do take place. Until I can produce evidence of comparable validity to show what these forces are, I must deny myself the privilege of explaining the phenomena which I know undoubtedly do occur.

DOES EXTRACTION SOLVE ALL OUR PROBLEMS?

Any intelligent orthodontist can provide the answer to that question: that answer is "No!" As I have indicated, and might have developed further, thoroughly satisfactory treatment of cases in which extraction has played a part is seen only infrequently. Some of the niceties of detail, such as the proper closure of spaces and axial positioning of teeth, have been ignored by many orthodontists when the removal of teeth has been a part of treatment. Those of us who share the belief that the subtraction of dental units should play a larger part in treatment planning than heretofore realized should labor as diligently in behalf of ideal treatment following extraction as we have heretofore labored to justify the point that extraction itself is necessary.

My own views on extraction, as an adjunct to orthodontic treatment, are much the same as those expressed by Lowrie J. Porter[4]: "This extraction theory can become a rolling stone which can do much harm in dentistry. The person who advocates judicial extraction and follows it with proper orthodontic treatment (which is actually a lot of supplemental hard work) may increase the percentage of outstanding successes in his practice, but without meticulous, carefully planned scientific care, extraction cases will result in unwarranted and unjustifiable failures . . . it must be emphasized that successful treatment obtained by extraction will only result if, following extraction, a very definite technique is used to close all spaces, with the adjacent teeth in upright position. IT IS NOT AN EASY WAY OUT."

SUMMARY AND CONCLUSION

1. If a stable, permanent result is to be attained in orthodontic treatment, mandibular teeth must be positioned properly in relation to basal bone.

2. Arch length may be permanently increased only to a limited extent. The labial movement of mandibular anterior teeth is indicated only when those teeth have been tipped to an abnormal lingual-axial inclination by a deep overbite or by some other mechanical factor. A limited amount of permanent increase may be obtained through buccal expansion, in some cases, but not in all. Distal movement of mandibular molars is called for only in cases of bona fide mesial drift, occasioned by the premature loss of second deciduous molars or the loss or congenital absence of second premolars.

These limitations upon permanently increasing arch length oblige the orthodontist to remove tooth structure in the majority of cases presenting with rotations, crowding, or with anterior teeth tipped forward of the bony base.

3. While extraction, when indicated, supplemented with judicious treatment, carries the promise of stable results, excessive lingual tipping of mandibular incisors is to be deplored almost as much as excessive labial tipping of these teeth.

4. The proper positioning of mandibular anterior teeth, neither too far labially nor too far lingually, demands careful case analysis. This involves a correct decision as to which teeth to extract, and involves the skillful pitting of anterior segment anchorage against anchorage in the posterior segments.

5. Orthodontists have been too prone to disregard the treatment itself as a possible explanation of relapse. Far more cases have relapsed due to failure on the orthodontist's part to assess properly the potentialities of the case in treatment, than have relapsed due to pressure from third molars or habits indulged in by the patient.

6. Measurements substantiating the preceding statements and cases illustrating the principles involved are included in the text of the paper.

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880 East Colorado Street

INDICATIONS FOR THE REMOVAL OF IMPACTED THIRD MOLARS AT AN EARLY AGE

GLENN R. HILLIN, D.D.S., DALLAS, TEXAS

INDICATIONS for the removal of impacted third molars at an early age is a subject of special interest and mutual concern to orthodontists and oral surgeons. It is a great honor and responsibility to discuss a subject about which there is such a wide divergence of opinion.

Impacted third molars have been the source of much discussion and worry to the dental profession as well as to our patients. It is hoped that this presentation will make a contribution to the solution of the question, "What shall we do with this problem child of the dental family?"

Discussion of orthodontic concepts and procedure must be entered into in order to clarify the subject, and I am aware that there are many problems peculiar to orthodontic practice which are not completely understood by those engaged in the practice of other branches of dentistry.

The opinions herein expressed are based on twenty-five years of clinical experience and observation, twenty years of which were devoted to the general practice of dentistry and five years exclusively to oral surgery.

The evolutionary trend is toward a lack of sufficient growth and development of the skeletal structures to accommodate a full complement of teeth without irregularity and malocclusion. The third molar becomes impacted due to lack of space in the arch for its normal eruption.

Broadbent,[1] by the use of cephalometric radiographs, which means, as you know, placing the head of a growing individual in the same relation to the tube and film at quarterly and semiannual intervals, studied the growth of the teeth in relation to the development of the face; he found that about the time the crowns of the third molars are completely formed, nature's plan in the full development of the skeletal structures fails to provide sufficient space for the eruption of the third molars. This lack of growth and development also fails to provide enough room for the incisor teeth, particularly the mandibular incisors to maintain the normal line of occlusion.

He concludes that any buckling of the lower dental arch at this stage cannot be attributed to pressure from erupting third molars, but rather the third molars, along with the incisors, are a victim of a failure of the skeletal structures to develop to proper size and proportion. His report is an interesting and excellent one, however, whether lack of space caused impaction of the third molars or the impacted third molar contributed to buckling of the arch. These conditions are usually seen in combination. We are confronted with a dis-

proportionate growth of the teeth and jaws resulting in crowding and malocclusion.

If it is determined to remove teeth in order to provide sufficient space without crowding, we must admit that clinical experience has proved that the third molars compare unfavorably in character and structure with the other teeth and, therefore, are the least valuable and dependable.

The orthodontist, at this stage, in diagnosing to remove the third molars, may be guided by the type and extent of malocclusion, the lack of harmony in the size of the teeth and arches, and whether impacted third molars are adversely affecting active treatment and the prognosis in the case.

Dr. Edward H. Angle, in 1900, defined orthodontics as that science which has for its object the correction of malocclusion, and he insisted on normal occlusion of a full complement of thirty-two teeth, which still remains a fine ideal, even if we are frequently forced to compromise. Since that time, orthodontists have broadened the definition to include a biologic concept, have developed numerous diagnostic adjuncts, photostatic pictures, cephalometric radiographs, gnathostatic models, measurements of cranial growth and development, and many others. No doubt they are all valuable aids in diagnosis. We cannot help but wonder, however, if we are not influenced by our concept of normal to the point of correcting malocclusion to a preconceived idea without due regard to individual variations.

Dental history records the employment of various heroic efforts to aid the eruption of third molars and the prevention of impactions and irregularites of the teeth. Removal of six-year molars has been recommended as a routine procedure to prevent impactions and crowding of the teeth, while others have advocated removal of the twelve-year molars. Twelve-year molars have been and are being removed in order to facilitate removal of impacted third molars.

Fortunately, very few have ever believed in this practice. Probability of the premature loss of the six-year molars under unusual susceptibility to caries is no longer a hazard in the light of present knowledge, particularly when caries prophylaxis is carried out.[2]

Everest J. Wilson,[3] advocated treatment of impacted third molars by orthodontic procedure. Among the benefits he expected to gain from this practice are: elimination of shock of the operation and of permanent injury to surrounding tissues, utilization of the tooth as a bridge abutment, relief from neurologic pain, in younger patients, help to balance articulation and prevent extrusion of the normally opposing molar, and if it is desirable to extract the tooth later the operation is greatly simplified. This is further evidence that removal of impacted third molars constitutes a greater problem in our minds than actually exists. We know from experience that one of the rarest conditions to be seen is a third molar in normal relation to the adjacent structures and the teeth in the opposing arch.

The question to be decided in an individual case is whether or not the impacted third molar is worth the heroic efforts necessary to try to make it useful and to what extent impacted third molars present a hazard in success-

ful orthodontic treatment. The theory that third molars must be retained in order to maintain proximal contact of the teeth anterior to them is without foundation in fact. Following the extraction of any other tooth, there is a tendency toward opening the proximal contacts of the teeth and active steps must be taken to prevent its occurrence. Also, there is a definite loss of vertical dimension, and this is in proportion to the number of teeth lost. Certainly, it must be admitted that there are cases in which the removal of a tooth or teeth is indicated, but we should have full knowledge of the results to follow. Physiologic function should also be included in the consideration, as well as the esthetic effect.

The main consideration in the removal of impacted third molars at an early age is as an aid in the prevention of malocclusion and, where the prognosis indicates, the possibility of a relapse. The term "relapse" is used as Hellman[4] uses it when he calls our attention to disturbances occurring in cases which have been successfully treated; therefore, relapse means a return to a former bad state. A distinction is drawn between relapse and failure.

We understand that moving teeth from one point to another is a simple task. But maintenance of the teeth and alveolar arches in the position established for them by active orthodontic treatment constitutes a greater problem.

Many causes have been advanced for the relapse of completed cases: malnutrition, acute infectious diseases, glandular disturbances, impacted third molars, and many systemic disease conditions, which may retard or increase the usual growth pattern. Some of these factors may be controlled while obviously others cannot.

Orthodontists do not often see their patients again at a time when the strong erupting force of the third molar exerts pressure in a mesial direction. The question may arise at this time, "How much responsibility should the orthodontist assume in the correction of malocclusion?"

Radiographic examination at an early age reveals the presence of impacted third molars, and, by observation of the directional growth of these teeth and the space between the distal surface of the second molar and the ramus of the mandible, the probability of impaction may be predicted with a high degree of accuracy.

May we say again that impacted third molars are due to insufficient backward growth of the jaws and may we also remind you that the ramus of the mandible develops and grows by the deposition of bone on the posterior border and resorption on the anterior surface. The diagnosis to remove impacted third molars is governed a great deal more by maturation of the individual than chronologic age. As we all know, we frequently see a wide variation between the two, sixteen-year dentition and twelve-year jaws, and vice versa. Many cases present with enormous teeth out of all reasonable proportion to the size of the jaws.

Any number of appliances and any amount of force, no matter how well conceived, will not cause sufficient growth and development to accommodate a full complement of teeth which will satisfy the esthetic and physiologic re-

quirements beyond nature's original or intended plan of growth and development for that individual. Certainly, oral surgeons are not called upon for the treatment of malocclusion, but they are frequently consulted and a great deal of their time is spent in the management of the many pathologic conditions developed from impacted and partially erupted third molars. Crowding of the teeth and malocclusion are seen in these cases with the rarest exceptions.

Many of these cases have had orthodontic treatment and most of them report that satisfactory results were obtained at the time treatment was discontinued. Pathologic conditions following impacted third molars constitute a systemic as well as a mouth health problem: follicular cysts, periodontal cysts, adamantinoma, pericoronal infection, Vincent's infection, trismus, cellulitis, caries, and resorption of the second molars.

Research has shown that a great percentage of all second molars show evidence of resorption and repair. The main question to be decided is when is the best time to remove impacted third molars. They should be removed at an early age before there is complete formation of the roots and the surrounding structures have become more calcified. It is easier on the patient at this stage than at any later date when the tooth is more deeply encased in hard bone; it also eliminates a long series of pathologic conditions which are likely to develop.

In the specific listing of indications for the early removal of impacted third molars, it seems that no improvement may be made on the summarization of C. Bowdler Henry,[5] Hon. Dental Surgeon, Royal Dental Hospital, London, England, in regard to indications for enucleation of the mandibular third molar, which he gives as follows:

(a) In early cases, before calcification of the third molar, when the crown of the second molar is crowded against the root of the first molar and when the third molar crypt is sharply tilted behind and above the second molar and crowded upon it.

(b) At a later stage, after calcification of the cusps, when the orientation of the crown of the third molar is seen to be abnormal, in either a mesio-oblique direction or in a lingual direction, especially when there is further evidence also of molar crowding on the second molar, which is being pressed under the posterior convexity of the first molar.

(c) When the molar teeth, and especially the third molar, are abnormally large.

(d) When the mandibular third molar is of normal size but the maxillary third molar is abnormally small or congenitally absent.

(e) When the third molar is grossly deflected by a supernumerary tooth.

(f) When through the early loss of the deciduous molars, the first and second molars having tilted forward, it is proposed to push them backward in order to allow the first and second premolars to erupt into their proper places.

To those who have been accustomed to thinking of the removal of impacted third molars in terms of a mutilating operation, or have seen examples of it, it may be positively stated that there is no occasion for it.

Dr. B. Lucien Brun[6] made the statement, and a large percentage of the oral surgeons concur in his views, "The orthodontist, however, on many occasions in which he is certain that the third molar teeth will not develop and erupt in a normal position, refers a patient to the oral surgeon at a time when the third molar is not fully developed. The unformed roots and large developmental sac and cavity surrounding the crown make it almost impossible to extract this tooth without extensive trauma to the soft tissue and removal of large portions of the bone overlying the tooth. At this stage of development, the angle of the jaw may be inhibited by the extensive bone trauma necessary to effect the removal of the tooth."

A brief description of the operation for removal of these teeth will follow later, but it may be stated now that production of extensive trauma is wholly unnecessary, and the statement may be made, 100 per cent, even though extensive bone trauma should follow, there would be no effect on the normal growth and development of the angle of the jaw.

Dr. Allan G. Brodie and Dr. Barnard G. Sarnat[7] reported a case of ectodermal dysplasia with complete anodontia. Anodontia represents lack of initiation of dental development which begins about the fifth week of intrauterine life. They found a complete absence of the alveolar process which did not result in a loss of facial height; mandibular position as a result of muscle balance was no different than it would have been were all the teeth present. The proportions within the facial area were strictly normal. Other instances could be cited. The data do not indicate that the presence or absence of teeth has any effect on facial growth and development.

The technique for the removal of impacted third molars has been greatly simplified, and, by the use of premedication in which the patient is well sedated, apprehension is satisfactorily eliminated. Local anesthesia may be employed in 95 per cent of these cases, even though the diagnosis has been made to remove all four third molars at one time. The patient has no unpleasant memories and the operation is completed in thirty or forty minutes.

A generous incision is used to gain easy access and also so that the tissues may be retracted with a minimum of trauma. The tooth is unroofed, so to speak, by removing only the bone over the occlusal aspect, at which time we remember the admonition, "The tooth is ours and the jaw is theirs." We now divide the tooth into sections by means of surgical burs. If the roots are not formed, impactors or hand chisels cannot be satisfactorily employed. This enables us to remove the fragments from the crypt through the small opening which we have made in the bone. Recovery of the patient is uneventful and occurs in less than a week's time, with the rarest exceptions.

The evidence presented here should establish the fact that when, where, why, and the consequences to follow the removal of a tooth are of a great

deal more importance than the actual removal, and, with it all, should call your attention to the old Persian proverb: "One pound of knowledge requires ten pounds of common sense to apply it."

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1203 MEDICAL ARTS BUILDING

Round-Table Discussion

Overbite Cases

This form of discussion invokes many questions, the answers to which are often as varied as the number of participants, but not so at this table.

In order to focus our opinions and cover as much ground as possible, a list of six questions was prepared, but due to the brief time allowed, only three were discussed.

A few weeks after the meeting, a letter was sent to each member of the panel, repeating the three questions discussed and asking that they outline their procedures and reply at their convenience. This was done to avoid the opinion of the chairman in the conclusions reached by the group.

The questions were discussed in the following order:

1. If a Hawley bite plane is used, do you use it before arch form and tooth position have been changed?
2. Or, do you use it after correcting irregularities, size, and shape of arches?
3. If other appliances or methods are used, what are they, and state your procedure.

Knowing that the allotted time for discussion was far too short, the questions were formulated with this in mind, which, it was believed, would encourage brief and concise replies.

Following are the replies received from the various and courteous members of the panel. They are listed by number.

1. "If the overbite is extreme, I would use a Hawley appliance with heavy or thick guide plane. This should be thick enough to permit the upper and lower anterior teeth to have a normal relationship when the Hawley is in position. This, of course, would mean that the lateral and posterior segments would be out of occlusion. Later, when the posterior teeth have erupted to increase vertical dimension, the Hawley appliance is no longer needed. A regular appliance is then used for arch expansion and correction of irregularities. With the overbite partially corrected, it makes it possible to use any appliance without the overbite interfering.

"In Class II, Division 1 cases, where the lower incisors have erupted too far or, rather, the posteriors not enough, then the placing of a Hawley retainer with a bite plane or guide plane helps in retaining the upper arch and also correcting the overlap of the anterior teeth. Perhaps here again, the posterior teeth have erupted to a higher level."

The Round-Table Discussion was held at the meeting of the American Association of Orthodontists, Colorado Springs, 1946.

2. A. "There was considerable discussion as to when the Hawley retainer should be used. One of the men was very much in favor of placing the Hawley retainer in very young patients showing a tendency to developing into overbite cases. His idea seemed to be more of a preventive measure than a corrective measure at an early age.

B. "Most of the men were of the opinion that it is better to place the Hawley retainer after the irregularities and arch form have been corrected.

C. "I do not remember as there was too much discussion in regard to the types of appliances used. However there was mention made of the round labial appliance above and the lingual below, with their auxiliaries.

"Personally I stick pretty close to the 0.036 round labial wire with lingual extensions extending from the six-year molar bands, engaging the premolars on the lingual, or the removable lingual appliance for the maxillary.

"For the mandibular appliance I almost always start with the lingual removable appliance, then add a round 0.036 labial arch as the case demands.

"The Johnson twin wire labial appliance can be used very nicely in most of these cases."

3. "I usually use a Hawley before the arch form and tooth position have been changed and I extend my acrylic up over the incisal edges of the upper incisors as suggested by Dr. Sved.

"After establishing approximately a normal overbite I finish my regulating with a typical Joe Johnson upper and lower twin arch mechanism. In placing the final retainer I again incorporate a bite plane."

4. "I was delighted to hear from you with reference to our Colorado Springs discussion on the 'overbite cases.' I believe that round-table discussions should be a permanent fixture on future programs, as we need to have some place where we can have some frank discussions on orthodontic problems.

"The type of appliance generally used by me in the treatment of distoclusion or overbite cases is as follows: Johnson loop molar bands; upper lingual 0.040 precious metal; twin bracket bands on the upper anterior teeth; and twin labial arch are used. If I feel that a more rigid labial arch is necessary, 0.036 buccal segments and 0.025 labial are used with McCoy tubes on anterior teeth. For the lower appliance a 0.040 precious metal lingual arch or a labial, 0.036, at times is used.

"The above appliance is used first to establish normal arch form, using intermaxillary rubbers. We endeavor to secure the patient's cooperation in obtaining normal breathing habits and facial muscular tone. After normal relationship of the teeth is established, the case is finished with an upper Hawley retainer and guide plane made of acrylic and Wipla wire. A lower soldered lingual arch is placed.

"In a certain few cases where normal expansion exists, I start out with a Sved bite plane and use it for a few months. This helps to change the curve of Spee and gives us a good start before the stationary appliances are placed. In most cases, however, narrowness of the arches and rotation of the teeth are present; so the immediate placing of stationary appliances seems to be indicated."

5. "The use of plates in orthodontic therapy is very valuable, particularly in cases where overbite is present. We start with the bite plate before any arch form or tooth position has been changed. I use a bite plate in acrylic with great pleasure in cases of deep overbite in order to depress slightly the lower anterior teeth and the upper anterior teeth, when they are protruding, and slightly open the bite, in order to increase or stimulate growth of the posterior teeth.

"It is very important to grind off the lingual surface of the plate which engages the lingual surface of the six anterior maxillary teeth. This has to be repeated several times depending upon how much the anterior teeth are moving lingually.

"When the bite has been opened, which occurs after several weeks of using the plate (sometimes two months), I put on the active appliances. For instance, we may have to move the upper molars and bicuspids distally in conjunction with the plate, in order to keep the bite slightly opened. After several weeks there is a space between the lower anterior teeth and the palate, and the posterior teeth are in contact again; then we add a thin surface of acrylic in order to open the bite still more.

"There are bite plates and plates with an inclined plane, called bite planes. We do not have enough time at our disposal to discuss these now."

6. QUESTIONS

A. If a Hawley is used, do you use it before arch form and tooth position have been changed?

B. Or, do you use it after correcting irregularities, size and shape, or arches?

C. If other appliances or methods are used, what are they and state your procedure?

ANSWERS

A and B. "Usually arch form and tooth position have been rearranged before Hawley is used.

C. "I have used with a great deal of success a type of tooth-bearing bite plane, given to the profession by Dr. Sved, of New York City. This appliance is used in deep overbite cases before tooth position or arch form correction is undertaken."

7. A. "In mixed deciduous dentitions a Hawley bite plane is used to open the bite prior to other mechanical interference.

B. "In permanent dentitions arch form and tooth positions are first completed before a Hawley bite plane is placed and arch relations are adjusted.

C. "In mandibular protractions a mandibular incisal guide plane similar to a Hawley is used with the guide plane arising above the incisal edges of the lower incisors and inclined far enough lingually to engage the maxillary incisors upon occluding. This is constructed after appliances have been placed. It is similar to a Hawley in respect to being removable and is made of acrylic (clear)."

8. "Your letter, regarding the round-table discussion at the last American Association of Orthodontists' meeting in Colorado Springs, received. I have tried on several occasions to formulate a rather concise reply to the three questions which you asked concerning the use of appliances in treatment of overbite cases. I still would like to comply with your request, but I find that it is impossible to express my thoughts, doubts, and experiences in the use of this questionable device in raising or opening the bite to eliminate interference during articulation and occlusion, also to increase the vertical dimensions of the face, all with the purpose of hoping to gain centric occlusion.

"As you can see, the mere stating of the problem is complex. Further written discussion would be more confusing than enlightening. Please hold me excused.

"Round-table discussions are excellent for social reasons, but for scientific accuracy, tend more to complicate than inform, because no phase of procedure can be explained fully. There were mere expressions of personal opinions without sufficient evidence for support. During our discussions, I attempted to interject the question of etiological background, which necessitated the use of some appliance to correct a deep overbite. Unfortunately, the thought became lost in the shuffle, because most of the men were more interested in appliance use rather than knowing why any appliance was necessary. However, I am for discussion even though it may be confusing at times, because from interested discussion will come the desire to seek information and some workable solutions to our common problems."

9. "As a general rule, I prefer to use a Hawley bite plate after correcting the irregularities, size, and shape of the arches, but do use this bite plate rather frequently on those cases having a pronounced or extreme supraocclusion of the mandibular incisors when there is a mild deviation of the maxillary incisors from their normal occlusal plane. I consider it a preliminary step in treatment. Only a small percentage of this type are of Class I, but are far more frequently of the Class II variation. Its usage is then almost wholly limited to those having a full set of permanent teeth (third molars excepted). The rapid changes in arch form, number, and position of teeth and lack of adequate anchorage during the eruption of the bicuspids and cuspids practically rules it out for those in this age span. Even so, I sometimes use it as a combination preventive and corrective form of treatment for those 6 to 9 years of age or thereabouts. I believe enough is gained along this line in modifying the condition for cooperative cases to justify its usage.

Answer to C.—"Regular orthodox methods of treatment are utilized by choosing the style that will solve the problems of the case most efficiently in my hands. I prefer the angle tiny (0.022 by 0.022) edge wire with bracket bands on all first molars, bicuspids, and incisors, if bite isn't too scissorslike in the beginning to prevent their usage. If so, space is gained by variable methods and this plan is followed in due time for the finishing stretch. The arch is first seated passively. The follow-up treatment consists of crimping the arch just mesially to the first bicuspids upward for upper incisors and downward for lower incisors, tempered, and reseated. Molar and bicuspid segments receive

same amount occlusal line of force that is exerted upward on upper incisors and downward on lower incisors. Thus, by this method vertical growth is theoretically obtained in the molar and bicuspid areas by placing all the uppers and lowers on the proper occlusal plane. This plan is followed after alignment has been established and after mesiodistal relationship of the molars has been corrected, if and when indicated. I prefer to follow the group or sectional process of treatment. I also frequently use depressor hooks on lingual and labial standard arches. I am not very successful in getting satisfactory end results unless they are treated with a full complement of permanent teeth. Many of these cases follow a hereditary anatomic pattern and, when this exists, I am always fearful of a relapse. As a safety precaution, I usually equip all of them at the end with Hawley bite plate appliance and instruct them to wear it every night, from one year to the next, and to return for replacement or adjustment whenever needed.

"Since drafting this report, I should like to add that I just examined a prospective case (girl aged 14) wherein the use of the Hawley bite plate as a prerequisite to other secondary orthodontic treatment is indicated in my opinion. In such cases, I would have them wear it every day and night for about six to eight months."

The members of this panel promptly answered the letter of my request, and I am sincerely appreciative of this courtesy and their effort in making our report of practical value.

E. N. BACH, TABLE CHAIRMAN.

REPORT OF THE LAWS AND INFRACTIONS COMMITTEE

It is the opinion of a majority of the members of this Committee that the Association should take very positive measures to curb the increasing tendency of several groups of members who endeavor to exploit to the public certain methods and procedures of orthodontic practice. This type of propaganda includes claims of personal superiority in ability to practice, which is detrimental to the advancement and progress of the practice of orthodontics and is in direct opposition to the basic and fundamental principles upon which this Association was founded. Previous reports have mentioned this condition and requested corrective measures.

It is also the belief of some members of this Committee that with the ever increasing number of men entering the practice of our specialty, who will eventually seek membership in this Association, a greater effort should be made by the entire membership to promote a better understanding of the aims and ideals which this Association sponsors.

L. M. WAUGH
S. S. CROUCH
JOHN R. MCCOY
W. B. STEVENSON
P. G. SPENCER

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Department of Orthodontic Abstracts and Reviews

Edited by

Dr. J. A. Salzmann, New York City

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Developmental Pediatrics: By Arnold Gesell, M.D., *J. Pediat.* **30**: 188-194, February, 1947.

The concepts of development and disease cannot be divorced. In many diseases it is the developmental consequences which are of critical concern. The severity and the incidence of disease are influenced by age and maturity. The vast field of allergy and immunity involves developmental factors at every turn. Many abnormal and atypical modes of development must be interpreted in terms of disease. Even malnutrition may lead to maldevelopment. Indeed, health may be here defined as that optimal condition of a growing organism which denotes and fosters a maximum of development.

Developmental pediatrics is a form of clinical medicine which is especially concerned with the diagnosis and supervision of child development.

Biologic and clinical science has demonstrated the intimate relationship of structure and function to such a degree that the old antitheses of mind versus body, heredity versus environment, and psyche versus soma have lost much of their force. The organism is regarded as an indivisible unit in which physical well-being and mental welfare are reciprocal and inseparable. This monistic outlook has such far-reaching implications for medicine that it has recently taken on the formidable, hyphenated designation, psychosomatics.

Psychosomatic medicine represents a more incisive recognition of the interaction and basic identity of physical and functional factors. Development, likewise, is a unifying concept which acknowledges that the laws and mechanisms of growth apply equally to body and mind. The infant comes by his mind (psyche) in the same embryologic way that he comes by his body (soma).

Growth, in all its aspects, normal and abnormal, has become the central problem of the biologic sciences. It is now apparent that the growth of tissues, organs, and behavior is obedient to universal laws of developmental morphology. These laws make for a certain degree of predictability of growth phenomena. As our knowledge of these laws deepens, human growth will come increasingly within the scope of clinical diagnosis and medical control.

All this rapidly evolving science is destined to make itself felt in the procedures of clinical pediatrics. In health and in disease, the child will be more and more appraised in terms of growth characteristics and of developmental status. (We use the words *growth* and *development* interchangeably.)

Indices of Development.—Developmental status manifests itself in three major kinds of signs and symptoms: anatomic, physiologic, behavioral. All of these manifestations are important from the standpoint of a developmentally oriented pediatrics.

Anatomic indices become significant when they go beyond mere height and weight, and deal with girths, body proportions, somatotypes, and growth rates. The new interest in the physical anthropology of the child will probably lead

to rapid photographic, and other methods of recording, which sum up valuable data pertaining to constitutional type.

Physiologic indicators can furnish much evidence concerning growth conditions because the bodily states of the organism change with age. With the remarkable advances now under way in biochemistry, electrometry, and micromeasurements, the physiologic diagnosis of infant development may in time reach a high degree of refinement and accuracy.

Behavior, however, will always remain the most comprehensive and the most sensitive indicator of developmental status. Medically considered, the infant is an action system which reveals itself in patterns of behavior. His behavior characteristics and capacities infallibly express the maturity of his neuromotor equipment and the achieved efficiency of his total organism.

The developmental diagnosis of infant behavior, accordingly, constitutes the major task of a developmental pediatrics. Anatomic and physiologic criteria of growth and well-being can never be safely ignored or slighted; but they must always be correlated with the crucial criterion of behavior. The motor, the adaptive, the language, and the personal-social behavior of the child sums up most completely his capacity to grow.

To appraise his behavior, we need systematic methods of interview, observation, and diagnosis. To elicit significant behavior patterns, we must use standard techniques skillfully adapted to individual and age differences. The examination must be conducted formally, with precision of purpose. In some twenty minutes we aim to have the infant display his most characteristic responses: his postural adjustments, his oculomotor control, his visual and auditory perceptiveness, his coordination of eyes and hands, his prehension, manipulation, and exploitiveness, his social awareness and communicativeness, the range and patterns of his attention, his general adaptivity, alertness, and competence to meet the total sequence of the examination. An amazingly rich array of significant behavior patterns can be evoked by a standardized sequence which uses the plain appurtenances of a crib, a table surface, and a series of simple test objects.

The Functions of Developmental Diagnosis.—In the hands of a clinician, who can bring a background of experience to bear upon his findings, a developmental examination of behavior serves at least five functions:

1. It ascertains the stages and patterns of developmental maturity in normal, subnormal, and superior infants.

2. It analyzes the total behavior equipment into components and makes possible differential diagnosis of normality, amentia, and specific developmental deviations.

3. It brings to light neurological defects and sensory impairments not disclosed by ordinary methods of clinical examination. (It is indispensable for detecting many mild and obscure forms of cerebral injury.)

4. It supplies important objective information concerning emotional traits and organization of personality.

5. It implements a constructive type of developmental supervision. Periodic developmental examinations define the growth pattern peculiar to the individual child and become the basis of a consecutive individualized child and parent guidance.

A student of pediatrics, in particular, should be infused with the doctrine of development, because this alone can give him adequate perspective for appraising the normal and abnormal symptomatologies of infancy. By systematic consideration of the somatic, physiologic, and behavioral manifestations of development, it will be possible to raise the study of normality to the dignity of a clinical subject. Clinical and supervisory pediatrics is pre-eminently concerned with the protection and the augmentation of normal well-being. For

this reason, it is anomalous that the critical diagnosis and interpretation of normal child development has such meager status in medical education.

A well-grounded pediatrician can be trained to expertness in one or two years of full-time participation in diagnostic and advisory service which deals with a wide range of normal and abnormal developmental conditions. Ideally, this specialized training should include the periodic contacts of well-baby supervision, the examination of infants prior to adoption and foster-home placement, and preschool children under nursery school auspices, and the differential diagnosis of a diverse array of mild and severe abnormalities, including retardation, amentias, aplasias, malformations, degenerative processes, cerebral injuries and other traumas, anoxemia, infections and toxic lesions, endocrine dysfunctions, sensorimotor handicaps, and environmental shocks and stresses.

Experts in the field of abnormal child behavior will always be in strong demand to serve as consultants or as members of a diagnostic group. In view of the historical trends of psychiatric medicine, this represents a logical function of a clinical child psychiatry.

For the vast work of preventive mental hygiene, however, we must look to pediatric medicine. In principle and in actuality, pediatrics is already committed to a form of supervisory health protection which includes mental as well as physical welfare. Since bodily growth and psychic development cannot be divorced, the methods of developmental pediatrics contain the essence of a preventive psychiatry of infancy and childhood.

To understand any child, whether normal or handicapped, we must understand his ways of growth. These ways of growth are the sum and substance of his psychic constitution, or his psychosomatic constitution. Only as we become aware of these ways of growth can we plan adequate procedures of guidance and control. Here lies the significance of a periodic examination of infant behavior as a pediatric approach to the mental hygiene of early child development.

The same kind of supervision would be highly desirable in well-baby conferences. There is a growing realization that the methods of these conferences should be more thoroughgoing, which is to say that they should be more individualized and focus more fully on developmental factors.

The medical management of cases of abnormality, impairment, and handicap becomes more considerate with a developmental approach, which leads to constructive follow-up contacts during the trying early years when parents profit most from timely and skillful guidance. Incidentally, a careful developmental examination which parents are permitted to observe often helps them to better understand their child and the methods of care which he will need at their hands.

The first and foremost function of developmental pediatrics in a large clinical center is diagnosis, because diagnosis involves a concrete estimate of growth potentialities and thereby serves to define the details of care and management. Diagnosis becomes cumulative and progressive with follow-up contacts. In developmental supervision, interpretive diagnosis and advisory guidance are closely combined in the interest of child and parent.

The recognition and interpretation of developmental defects and deviations requires a vivid acquaintance with the characteristics of normality. The clinician will, therefore, see to it that he and his students make ample contact with relatively normal infants and children at varying age levels. Provisions for the developmental supervision of "normal" infants may some day become an accepted feature of hospitals which also function as health centers. Certainly, the public health activities of the future will become increasingly clinical, that is, individualized, and they will place a prior premium on mental health in infancy and preschool childhood.

The Health of the School Child: By Gertrude E. Cromwell, R.N., M.S., Supervisor, Bureau of Health Education and School Nursing, Des Moines Public Schools. 256 pages with 46 illustrations. Price $2.50. Philadelphia and London, W. B. Saunders Company, 1946.

Child growth and development in relation to physical fitness are discussed. With regard to the dentition, we find that the teeth are looked upon as an important factor in nutrition, especially as it concerns the prenatal stage. Public health nurses are advised to watch the dental literature concerning dental caries problems, since this subject "is alive and growing." It is to be hoped that future editions of this book will include more material on the teeth that will be helpful to health education teachers. When we consider that dental defects outnumber all others, we expect books on health education to give them equal prominence with sight and hearing conservation.

The National Formulary: Prepared by the Committee on National Formulary under the Supervision of the Council by Authority of the American Pharmaceutical Association. Eighth edition. National Formulary VIII. Washington 7, D. C., American Pharmaceutical Association, 1946.

The National Formulary, first published in 1888, is now in its eighth edition. It is a product of the American Pharmaceutical Association. The Formulary has set itself the task of standardizing formulas for unofficial preparations with the view of reducing the multiplicity of preparations which differ in nonessential proportions of constituents in colors or in flavors.

In the present edition, the primary title of each drug monograph is in English, while botanical and zoological names conform to the rules of "The International Botanical Congress and the International Zoological Congress." Standards of identity, strength, and purity are included.

Among the new additions to the eighth edition of *The National Formulary* are articles on chalk powder compounds, eucaine hydrochloride, and many other preparations of interest to dentists. In addition to monographs on drugs, chemicals, and preparations, a section is presented on reagents and preparations for use in the clinical laboratory. This includes directions for the microscopic examination of saliva and sputum, as well as directions for culture reading and staining techniques.

In the chapter entitled "General Tests, Processes and Apparatus," procedures are presented for alcohol determinations and many others. The Formulary contains many tables, charts, grafts, and an excellent index.

News and Notes

Charles H. Tweed Seminar

The first postwar meeting of the Charles H. Tweed Seminar for Orthodontic Study and Research was held at Tucson, Arizona, from March 28 to April 9, 1943, inclusive.

Permanent headquarters for the Seminar were constructed in the suburbs of Tucson and include ample teaching accommodations for 125 members and guests. The Seminar building consists of a number of laboratories surrounding a large lecture hall. In this air-conditioned and fully equipped building were gathered orthodontists from more than half of the states in the Union and from Australia, South Africa, South America, and Cuba. Dr. Hays H. Nance, a widely known and recognized orthodontist who has made outstanding contributions to the field of orthodontics, was president of the Seminar.

At the opening session, a message of greeting was read from Honorable Sidney P. Osborn, Governor of Arizona. The Seminar was welcomed to Tucson by Mayor Henry O. Jaastad and Mr. James F. Houston, president of the Chamber of Commerce.

The object of the Seminar is to stimulate research in projects related to orthodontics, to develop intensive and accurate methods of case analysis whereby a clear concept of the correct plan of treatment may be evolved, and to refine and simplify technical procedures.

The idea of such a seminar originated with Dr. Tweed, whose outstanding contributions to clinical orthodontics have attracted the interest of members of the specialty to an unusual degree. In furthering this plan, he received the cooperation of a group of selected associates.

The program was devoted to both scientific and technical instruction. On the scientific portion of the program appeared Dr. Wendell L. Wylie of the University of California, Dr. Herbert I. Margolis of Tufts University, College of Dentistry, and Dr. Hays N. Nance of Pasadena.

Dr. Charles H. Tweed introduced the practical instruction with a review of what is now generally known as the Tweed technical procedure in the application of the edgewise arch mechanism. Dr. Tweed correlated the significance of the Frankfort-mandibular angle to case analysis and treatment planning. He outlined the various methods of treatment as influenced by the determination of this angle on the individual patient.

Dr. Harold D. Kesling of LaPorte, Indiana, demonstrated a method of determining the correlation between dental arch size and the underlying bones of the jaws. Dr. Kesling's demonstration was followed by a session of laboratory work in which the members of the Seminar determined for themselves, under a group of instructors, the practical application of this method of case analysis. A paper entitled "The Fallacy of Overexpanding the Dental Arch in Orthodontic Treatment" was presented by Dr. Robert H. W. Strang of Bridgeport, Connecticut.

Dr. F. Copeland Shelden of Kansas City, Missouri, gave a report of a project, the purpose of which was to correlate by a series of measurements arch length to arch width to determine the adequacy of basal bone for the accommodation of the dental arch in good occlusion.

An instrument, described as a "maxillator," for measuring the various facial angles in case analysis, was presented and described by Dr. J. A. Salzmann of New York City.

Placement of the edgewise arch mechanism was demonstrated by Dr. Glendon H. Terwilliger of the University of California, San Francisco, who then provided individual instruction, with the aid of a corps of assistants. The technique of treatment of the various classes of malocclusions was discussed and demonstrated. These procedures were then carried out by the members of the Seminar under the supervision of a large group of instructors.

Every member and guest at the Seminar was required to present for evaluation complete records of treatment of six cases completed within the past twelve months and two additional cases for analysis.

Plans have been completed to hold annual meetings of the Seminar.

Annual Seminar for the Study and Practice of Dental Medicine

The West Coast's Fourth Annual Seminar for the Study and Practice of Dental Medicine will be held at the Ahwahnee Hotel, Yosemite Valley, California, Oct. 19 to 24, 1947, according to an announcement by Dr. Hermann Becks, President of the Board of Directors and Professor of Dental Medicine at the University of California.

Sponsored by all the Pacific Coast Dental Associations, the Seminar combines lectures with informal group discussions and question periods. The lectures will be on nonmechanical subjects, emphasizing the application of the basic sciences to the practice of dentistry, and will include such topics as nutrition, enzymology, endocrine disturbances, virus diseases, and protein biology. Among the speakers will be Dr. William A. Albrecht, University of Missouri; Dr. Allan G. Brodie, Dr. Isaac Schour, and Dr. John B. Youmans, University of Illinois; Dr. Thomas Francis, Jr., Dr. Howard B. Lewis, and Dr. L. H. Newburgh, University of Michigan; and Dr. Gustav W. Rapp, Loyola University, Chicago, Illinois.

The number of seminarians will be limited and applicants are required to submit a case report and must have attended a postgraduate course in the basic sciences or its equivalent, during the current year.

American Dental Association—Annual Meeting

Hotel reservations for the eighty-eighth annual meeting of the American Dental Association at Boston, Aug. 4 to 8, 1947, should be made immediately with the A.D.A. Housing Bureau at Boston.

Every effort will be made to accommodate satisfactorily all members of the Association planning to attend. The critical hotel situation, however, makes it imperative that requests for rooms be filed early.

Application blanks for reservations plus instructions for filling them out are available in all current issues of the *Journal of the American Dental Association.* Additional copies of these blanks may be secured from the A.D.A. Housing Bureau, 80 Federal Street, Boston 10, Massachusetts.

So that hotel assignments may be handled as conveniently as possible for all members, it has been decided that reservations will be accepted only by the Housing Bureau in Boston. Reservations will not be accepted either by the A.D.A. Central Office in Chicago or the Committee on Local Arrangements in Boston.

The Boston meeting, featuring the first scientific sessions of the American Dental Association since 1941, and the Tenth International Dental Congress, which has not been convened since 1935, is expected to draw an attendance of between 12,000 and 15,000 persons.

Because of the large attendance expected and the limited number of hotel rooms available, the Housing Bureau has formulated strict rules for the handling of all hotel reservations.

All reservations made will be subject to confirmation by the holder by July 15. Forms for this purpose will be sent to reservation holders by the Housing Bureau about June 15. Failure of the holder to confirm reservations by July 15 may result in their cancellation at the option of the Housing Bureau.

It is expected that most of the official delegates can be assigned rooms at the Statler Hotel, where sessions of the House of Delegates will be held. Near-by hotels will be available to other delegates.

Single rooms are extremely limited in number and all members are asked to share rooms with fellow dentists whenever possible.

American Dental Association—News Releases

Requirements for certification of dental specialists in five fields of dental practice were announced today by the Council on Dental Education of the American Dental Association.

The dental specialties included in the Council's report, published in the current issue of the *Journal of the American Dental Association,* are:

Oral surgery; orthodontics (teeth-straightening); pedodontia (children's dentistry); periodontia (treatment of gum diseases); and prosthodontia (artificial dentures).

Following the same general pattern used in the certification of medical specialists, the Council urged that the certification of dental specialists be national in scope and under the voluntary control of the professional groups involved. It declared:

"The desirable features of voluntary certification by professional groups seem to outweigh the arguments in favor of government control. Already six states which have enacted specialty laws have set varying and even conflicting standards and regulations. If now the forty-nine dental examining boards of the United States should be authorized to fix qualifications for the licensing or certification of specialists . . . utter confusion and chaos would result."

Basic requirements for certification of dental specialists were listed by the Council as:

Graduation from an accredited dental school, U. S. citizenship, membership in either the American Dental Association or the National Dental Association, a license to practice dentistry, one year of advanced training, three years of practice primarily and principally in the specialty, and the passing of an examination prescribed by a specialty board.

In cooperation with the American Dental Association, the American Society of Oral Surgeons has established the American Board of Oral Surgery to certify specialists in that field. This Board will hold examinations in Boston July 29 and 30, immediately preceding the eighty-eighth annual meeting of the American Dental Association. The American Board of Orthodontics has also been established and the remaining three specialties will establish boards in the near future.

Congressional action to eliminate "gross maladministration" of the Army Dental Corps at the hands of Army "brass hats" was demanded today by the *Journal of the American Dental Association.*

The lead editorial in the current issue of the Journal said that the Army high command had "secretly recalled" corrective regulations issued at the close of World War II.

The Journal urged Congress to act immediately in the interest of providing adequate dental health services to American military personnel.

"During the entire war," the editorial said, "dental officers in the Army were compelled to work under regulations that represent nothing less than the gross maladministration of a vital health service. Even when this maladministration approached the stature of a national scandal the dental officers of every rank openly stated that it gravely impaired the effectiveness of the Army Dental Corps in time of war, the "brass hats" of the Medical Department and of the Army Dental Corps were unwilling to move directly for correction. Every strategy was used by these past masters of delay and reaction to prevent a corrective change in dangerously outmoded and openly discriminatory regulations."

The Journal said that the American Dental Association withheld an appeal to Congress during wartime because it might interfere with the successful prosecution of the war and relied on Army promises that corrections would be made administratively.

In August, 1945, just before the surrender of Japan, the Army issued revised regulations which the Journal said represented a minimum of concessions to the profession. A little over a year later, on Aug. 23, 1946, these revised orders were recalled without notice to the profession, the Journal said.

Listing comparisons of the 1945 and 1946 orders, the editorial continued:

"If more evidence of the need for courageous and able administration in the Army Medical Department and the Army Dental Corps is wanted, this secret recalling of corrective regulations for publicly admitted failures should provide it."

The Journal said that full facilities of organized dentistry would be joined in an appeal to Congress for relief.

"The remedies for the situation are clear," the editorial said. "Dentistry must ask immediately for a larger voice in the selection of the Surgeon General and Dental Corps

officials. For too long a time these appointments have been permitted to be the subject of Army ritual and reaction.

"Dentistry must man the Army Dental Corps with officials and personnel who are able to envision at least the basic problems of their profession and their duty of rendering a health service to the persons under their charge.

"Dentistry must use all of its resources to make impossible again such utterly high-handed and arbitrary management of professional affairs. Dentistry must enlist the aid of Congress, which, through investigation and legislation, can prove that there is authority superior to that of the Army hierarchy."

Dr. Paul F. O'Brien of St. Louis, Missouri, has been named chairman of the committee of judges for the 1947 junior essay contest sponsored by the American Dental Association.

Other judges for the contest are Dr. J. B. Carr of Indianapolis, Indiana, who is a member of the A.D.A. board of trustees, and Dr. Joseph J. Obst, of Brooklyn, New York, according to an announcement by Dr. Paul W. Zillman of Buffalo, New York, chairman of the Committee on Membership.

Four winners will be selected in this year's contest. Each winner will receive a trip with all expenses paid to the eighty-eighth annual meeting of the American Dental Association at Boston, Aug. 4 to 8, 1947.

All Junior members of the American Dental Association who are members of the Junior class of an approved dental school are eligible to compete in the contest. Each school, however, will be permitted only one entrant.

The subject for this year's contest is "Dental Health as a Community Health Problem." Manuscripts must not exceed 1,000 words and must reach the Committee on Membership by May 1, Dr. Zillman said.

Benefits to Medical Department of Proposed Legislation Before Congress

Highlights of the Benefits to the Medical Department of the proposed legislation now before Congress (HR 2536) on procurement, promotion, and elimination of regular Army officers are outlined in the following statement recently issued by the Office of the Surgeon General:

The bill introduced in Congress to provide for the procurement, promotion, and elimination of regular Army officers and for other purposes provides that Section 10 of the National Defense Act be amended to read: "The Medical Department shall consist of Surgeon General with the rank of major general, four assistants with the rank of brigadier general, one of whom shall be an officer of the Dental Corps" is amended to read: "The Medical Department shall consist of one Surgeon General with the rank of major general, one assistant with the rank of major general who shall be an officer assigned to the Dental Corps, and three assistants with the rank of major general or brigadier general as determined by the Secretary of War."

In addition it authorizes a strength of active permanent general officers of the regular Army in the Medical Corpus equal to three-fourths of 1 per cent of the authorized active commissioned strength of the Medical Corps of the regular Army. Of a total authorized strength of active general officers there are authorized 50 per cent in the grade of major general and 50 per cent in the grade of brigadier general.

It provides for promotion lists in the Medical Department as follows: The Medical Corps Promotion List, the Dental Corps Promotion List, the Veterinary Corps Promotion List, and the Medical Service Corps Promotion List. Of the total authorized promotion list strength for the entire Army, there are authorized 8 per cent in the grade of colonel, 14 per cent in the grade of lieutenant colonel, 19 per cent in the grade of major, 23 per cent in the grade of captain, 18 per cent in the grade of first lieutenant and 18 per cent in the grade of second lieutenant. The authorized number in each of the several grades in each of the several promotion lists is to be prescribed by the Secretary of War by a schedule of percentages in grades for that list, which schedule of percentages may be different for each promotion list.

However, a saving clause provides that irrespective of any vacancy in any grade, except general officers and colonels, whenever an officer whose name is carried on any recommended list under provision of this section completes for promotion purposes the prescribed number of years in the grade of first lieutenant, captain, and major, the authorized number of officers in the grade of captain, major, and lieutenant colonel, respectively, in the applicable promotion list shall be temporarily increased, if necessary, to authorize the appointment in that grade of such officer and all officers of his grade and promotion list whose names appear above his on the recommended list and such officers shall be simultaneously appointed in that grade, retaining among themselves their existing relative seniority. Until Dec. 31, 1947, initial appointments and promotions shall continue to be made in accordance with the present provisions of the integration and other laws, but effective Dec. 31, 1947, no further appointments shall be made except under the provisions of this bill. The bill provides for promotion by selection to all grades to fill existing vacancies. However, irrespective of the existence of any vacancies, promotion list officers of the line of the Army may be selected for promotion to the grade of first lieutenant, captain, major, and lieutenant colonel upon the completion of three years' service, seven years' service, fourteen years' service, and twenty-one years' service. However, for the Medical Department each person appointed as an officer of the regular Army shall at the time of appointment be credited with the amount of service equal to four years for the Medical Corps, three years for the Dental Corps, and two years for the Veterinary Corps, which means that an officer in the Medical Corps appointed as a first lieutenant will be promoted to the grade of captain upon the completion of three years' service; to the grade of major, upon the completion of ten years' service, and to the grade of lieutenant colonel upon the completion of seventeen years' service, and is eligible for selection to the grade of colonel upon the completion of eighteen years' service if vacancies do not occur in the respective grade at an earier date. Therefore, effective Dec. 31, 1947, each officer of the Medical Corps who on that date has less than four years' service credit, each officer of the Dental Corps who has less than three years' service, and each officer of the Veterinary Corps who has less than two years' service, shall be credited for promotion purposes with four years, three years, and two years service, respectively.

Since the integration laws known as Public Laws 281 and 670, 79th Congress, permitted credit for appointment purposes to officers of the Medical Department equal to the difference between their age at the time of appointment and the age of twenty-five years, an inequity was created for officers of the Medical Department of the regular Army whose average age at the time of original appointment was 28 years, 5 months. In order to overcome this inequity and place all officers of the Medical Department on equal footing so far as age in grade is concerned, the bill provides for the granting of credit to officers of the Medical Department commissioned between June 27, 1926 and Dec. 28, 1945, and who had continuous active commissioned service in the regular Army since such appointment.

Effective Dec. 28, 1945, such officers are credited, respectively, with additional years of service as follows: Medical Corps 3 years, 5 months, Dental Corps 3 years, 1 month, and Veterinary Corps 1 year, 4 months. The service credited shall be counted for promotion and permanent seniority purposes only. No change, however, will occur in the relative permanent seniority standing of any officer who held a commission in any of these corps on Dec. 28, 1945.

The bill provides that on July 1, 1948, or at the earliest practicable date thereafter, regular Army officers shall be promoted and appointed in the grades of first lieutenant, captain, major, and lieutenant colonel to fill initial requirements which exist in those respective grades. In the case of all Medical Department Promotion Lists, owing to the present reduced strength of the various corps, there now exists a number of vacancies, which means that officers presently in the various corps of the Medical Department, those being integrated and the ones to come into the service after Dec. 31, 1947, may look forward to more rapid promotion than has ever heretofore existed in the Medical Department of the Army.

In addition to promotion to permanent grades in the regular Army, the bill provides for promotion to temporary rank whenever the number of permanent appointments in the grades

of colonel, lieutenant colonel, major, captain, and first lieutenant, respectively, is less than the number authorized in these grades in such promotion list.

The bill likewise provides that from time to time officers of the reserve components of the United States Army may with their own consent be ordered to active Federal duty for such length of time as the President may prescribe and that when the total number of officers serving on active duty, regular Army, and all officers of the Army of the United States of any component exceed the authorized active commissioned strength of the regular Army, the Secretary of War shall determine the requirements in each of the several grades and temporary promotions are authorized for officers of these components to fill these requirements.

It is anticipated that there will exist in the Medical Department of the regular Army 1,900 vacancies in the Medical Corps, 370 vacancies in the Dental Corps, 10 vacancies in the Veterinary Corps, and 440 vacancies in the Medical Service Corps.

Even though all of these vacancies in the Medical Department of the regular Army could be filled, there will still be needed several thousand reserve component officers on active duty to meet the requirements in each and every corps of the Medical Department to fulfill the needs of the anticipated strength of the interim Army.

Northeastern Society of Orthodontists

The next meeting of the Northeastern Society of Orthodontists (formerly New York Society of Orthodontists) will be held at the Waldorf-Astoria Hotel, New York, on Monday and Tuesday, Nov. 10 and 11, 1947.

Officers of Pacific Coast Society of Orthodontists

The following officers of the Pacific Coast Society of Orthodontists were elected for two years at the meeting of Feb. 24, 25, 26, 1947, in San Francisco:

President, Dr. S. B. Hoskins, Medical Dental Building, Portland 5, Oregon.

President-Elect, Dr. C. F. S. Dillon, Taft Building, Hollywood 28, California.

Vice-President, Dr. Fred Wolfsohn, 209 Post Street, San Francisco 8, California.

Secretary-Treasurer, Dr. Frederick T. West, 870 Market Street, San Francisco 2, California.

Member of the Editorial Board of Sectional Editors is Dr. James D. McCoy, 405 North Bedford Drive, Beverly Hills, California.

Notes of Interest

Adelbert Fernald, D.M.D., announces the association of Ben Wayburn, D.M.D., in the exclusive practice of orthodontics at 87 Water Street, Exeter, New Hampshire.

Dr. A. Frank Heimlich announces the association of his son, Dr. Albert C. Heimlich, in the exclusive practice of orthodontics at 1824 State Street, Santa Barbara, California.

Dr. Harry Metz announces that his son, Dr. H. Cameron Metz, Jr., has returned from military service and will be associated with him in the practice of orthodontics at 1201-1202 Highland Building, Pittsburgh 6, Pennsylvania.

Dr. Thad Morrison, Sr., announces the removal of his offices to 353 North Court, Doctors Building, 490 Peachtree Street, N.E., Atlanta, Georgia, practice limited to orthodontics.

Dr. Oren A. Oliver and Dr. William H. Oliver announce the removal of their office to 1915 Broadway, Nashville 4, Tennessee.

Dr. T. C. Sparks announces the association of Dr. M. W. Cheatham, Jr., in the exclusive practice of Orthodontics, Medical Arts Building, Columbia, South Carolina.

Dr. William Wedeen and Dr. Sylvester J. Hecht, orthodontists, announce the removal of their office to 16 Broad Street, Red Bank, New Jersey.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY is the official publication of the American Association of Orthodontists and the following component societies. The editorial board of the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY is composed of a representative of each one of the component societies of the American Association of Orthodontists.

American Association of Orthodontists

President, Earl G. Jones - - - - - - - - - - - 185 East State St., Columbus, Ohio
President-Elect, Lowrie J. Porter - - - - - - - - - 41 East 57th St., New York, N. Y.
Vice-President, G. Vernon Fisk - - - - - - 818 Medical Arts Bldg., Toronto, Ont., Can.
Secretary-Treasurer, Max E. Ernst - - - - 1250 Lowry Medical Arts Bldg., St. Paul, Minn.

Central Section of the American Association of Orthodontists

President, C. S. Foster - - - - - - - - - - - - 803 Dows Bldg., Cedar Rapids, Iowa
Secretary-Treasurer, L. B. Higley - - - - - - - - 705 S. Summit St., Iowa City, Iowa

Great Lakes Society of Orthodontists

President, S. Stuart Crouch - - - - - - - - - - 86 W. Bloor St., Toronto, Ont., Can.
Secretary-Treasurer, C. Edward Martinek - - - - - - 661 Fisher Bldg., Detroit, Mich.

Northeastern Society of Orthodontists

President, John W. Ross - - - - - - - - - - - - 1520 Spruce St., Philadelphia, Pa.
Secretary-Treasurer, Oscar Jacobson - - - - - - - - 35 W. 81st St., New York, N. Y.

Pacific Coast Society of Orthodontists

President, S. B. Hoskins - - - - - - - - - - - Medical Dental Bldg., Portland, Ore.
Secretary-Treasurer, Frederick T. West - - - - - - 870 Market St., San Francisco, Calif.

Rocky Mountain Society of Orthodontists

President, Henry F. Hoffman - - - - - - - - - 700 Majestic Bldg., Denver, Colo.
Secretary-Treasurer, Harry V. Banks - - - - - - - - 1550 Lincoln St., Denver, Colo.

Southern Society of Orthodontists

President, J. E. Brown - - - - - - - - - Merchants National Bank Bldg., Mobile, Ala.
Secretary-Treasurer, Leland T. Daniel - - - - - - 407-8 Exchange Bldg., Orlando, Fla.

Southwestern Society of Orthodontists

President, R. E. Olson - - - - - - - - - - Union National Bank Bldg., Wichita, Kan.
Secretary-Treasurer, Marion A. Flesher - - - Medical Arts Bldg., Oklahoma City, Okla.

American Board of Orthodontics

President, Oliver W. White - - - - - - - - 213 David Whitney Bldg., Detroit, Mich.
Vice-President, Joseph D. Eby - - - - - - - - - - 121 E. 60th St., New York, N. Y.
Secretary, Bernard G. deVries - - - - - - - Medical Arts Bldg., Minneapolis, Minn.
Treasurer, James A. Burrill - - - - - - - - - - 25 E. Washington St., Chicago, Ill.
James D. McCoy - - - - - - - - - 3839 Wilshire Blvd., Los Angeles, Calif.
Stephen C. Hopkins - - - - - - - 1726 Eye St., N.W., Washington, D. C.
Reuben E. Olson - - - - - - - - - - 1115 River Blvd., Wichita, Kan.

In the January issue each year, the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY will publish a list of all of the orthodontic societies in the world of which it has any record. In addition to this, it will publish the names and addresses of the officers of such societies.